BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SOCIAL SCIENCES AND HUMANITIES

DEPARTMENT OF SOCIAL WORK

REG NUMBER: **B200720B**

PROGRAM: Social Work

RESEARCH TOPIC: A study on the effects of climate change in vulnerable communities in Zimbabwe. A case study of Mucheke, Masvingo.

RELEASE FORM

NAME OF STUDENT : MANYANI TAKUNDA

STUDENT NUMBER : B200720B

TITLE OF RESEARCH : **A study on the effects of climate change in vulnerable communities in Zimbabwe. A case study of Mucheke, Masvingo**

DEGREE TITLE : BACHELOR OF SCIENCE HONOURS DEGREE IN SOCIAL WORK

YEAR OF COMPLETION : //2024

Permission is hereby granted to Bindura University of Science Education to produce duplicates of this dissertation and to lend or sell such copies for private, scholarly or scientific purposes only. The author does not reserve other publication rights and neither the dissertation nor extensive extracts from it may be printed or otherwise reproduced without the author's consent and written permission.

SIGNED..... T.MANYANI …….

DATE...../24.....

CONTACT DETAILS : 0782508923 / 0773473963

HOME ADDRESS :

DECLARATION FORM

I, Takunda Manyani, hereby declare that this dissertation submitted to Bindura University of Science Education has never been previously submitted by me for a degree at this or any other university, that this is my own work in design and execution, and that all material contained therein has been duly acknowledged.

Signed

……..

Date:

…….

ACKNOWLEDGEMENTS

I would first and foremost like to express my deepest gratitude to my parents for supporting me financially and emotionally, and for giving me this opportunity to pursue this degree program. I would also like to appreciate my supervisor, Mrs. Chigondo for her invaluable advice, guidance and patience throughout my studies. Without this support, I would not have been able to complete my degree. I would also like to give thanks to the lord and Jesus Christ for the blessings and grace that have been bestowed upon me. Finally, I would like to thank the Bindura University of Science Education for its guidance and support I am very grateful to all the members of the faculty and staff at the University who have helped me in my academic journey. Their dedication and expertise have been instrumental in helping me archive my goals.

DEDICATIONS

To my family and friends for support and understanding especially to my mother and my father, Mr. and Mrs. Manyani as well as my siblings, who stood by me and supported me both morally and financially during the tenure of the study.

God bless you

ABSTRACT

This study critically examines the effects of climate change on vulnerable communities, with an eye on the effectiveness of any interventions being suggested and proffered by government and its development partners. The study delves into the phenomenon of climate change, with a deliberate focus on urban life and how much the phenomenon has altered it. Through employing a qualitative approach, the research investigates the policy's implementation at local, regional, and national levels, shedding light on the discrepancies between policy intentions and practical outcomes. Through qualitative interviews and administered questionnaires, the lived experiences and perspectives of citizens and development practitioners are explored, offering valuable insights into the shortcomings of what is being done thus far. The findings of this study underscore the urgent need for targeted interventions and policy reform to address the identified gaps. The research concludes by proposing actionable recommendations aimed at enhancing the fight against climate change, at a time when the scourge is becoming more and more threatening.

BINDURA UNIVERSITY OF SCIENCE EDUCATION

Dissertation marking guide

SW415/DSW218

This section must be completed by the student

STUDENT NAME: TAKUNDA MANYANI

STUDENT REGISTRATION NUMBER: B200720B

PROGRAMME: BACHELOR OF SCIENCE HONOURS DEGREE IN SOCIAL WORK (BSW)

MONTH AND YEAR: JUNE 2024

DISSERTATION TITLE: **A study on the effects of climate change in vulnerable communities in Zimbabwe. A case study of Mucheke, Masvingo**

…….

DUE DATE: / /24 **DATE OF SUBMISSION**

I confirm that I have read and understood the Bindura University of Science Education Regulations on plagiarism.

Student's signature..... T.Manyani___ Date...../ /24_____

.....

This section is to be completed by the Supervisor.

I ……. confirm that I have supervised……. during the writing of his/her dissertation.

Further comments (If any):

Supervisor`s Signature **……** Date …….

The following sections to be completed by the examiner

Please note that your recorded marks are in accordance with the criteria given below

1. **Abstract: (worth 10%)**

Does it give a brief and precise overview (*study purpose, setting, objectives, brief methodology, findings/results, conclusion and recommendations*) of the dissertation? Are the items presented in chronological order?

First Marker ☐

Second Marker ☐

Actual Mark ☐

Comments

……

……

2. **Study title, Introduction, statement of the problem, aim, objectives and study justification (worth 10%)**

Is the research title, introduction, statement of the problem aim and objectives clearly defined, contextualised and scientifically grounded? Does the study justification highlight issues related to gaps in knowledge, beneficiaries of study results and contribution to policy? Is the research focus and rationale (*scope of the research project and reason for choice*) given in a clear, specific and convincing manner?

First Marker ☐

Second Marker ☐

Actual Mark ☐

Comments:

……

……

……

3. **Literature review (worth 10%)**

Does the candidate display a wide range of reading and relevance to research question: are sources relevant, up-to-date and cover necessary and sufficient ground? Is there a critical evaluation or critique of previous work: not just a summary but an objective evaluation? Is there a positioning of research within conceptual/ theoretical framework of the area/discipline(s): overt statement of how research relates to previous research and theories prevalent in the field?

First Marker ☐

Second Marker ☐

Actual Mark ☐

Comments:

……

……

……

4. Research Methodology (worth 20%)

Does the candidate show an appreciation of methodological issues and rationale for chosen approach: an explanation of the reasons behind the choice of methods and any problems/ limitations that might arise? Is there a demonstration of skill in the selection and use of research methods, techniques and strategies? Does the dissertation show progression from research objectives to research findings? Is there an explanation of steps taken to ensure the method chosen is appropriate and will yield results that can be suitably analysed (*Reliability and validity of methods*)? Is there a well-developed awareness and appreciation of ethical issues/ aspects of the work as relevant to the study on data collection?

First Marker ☐

Second Marker ☐

Actual Mark

Comments:

……

……

……

5. Data Presentation, Interpretation, Analysis and synthesis (worth 30 %)

Did the candidate make sense of data, results, information and/or findings? Is data presented coherently, logically, clearly & succinctly? Is there a thorough, accurate and rigorous analysis of data? On evaluation and application of theory, did the candidate link the analysis of the data to theories and data presented by other researchers and evaluating own and others' data as well as the theories backed by them?

First Marker

Second Marker

Actual Mark

Comments:

……

……

……

6. Summary, Conclusions, and Recommendations (Worth 10 %)

Does the summary give a brief analysis of the findings? Are the conclusions consistent with analysis, discussion of the research findings? Do conclusions make reference to statement of the problem, theoretical framework and objectives of the study? Are recommendations consistent with the objectives and the study findings?

First Marker

Second Marker

Actual Mark

Comments:

……

……

……

7. Academic Conventions and contribution to Social Work practice (worth 10%)

Is the dissertation captivating and well presented**? -** Structure of material (List of contents, headings, subheadings, footnotes, appendices). Is there a clear appropriate & logical presentation of data / findings (e.g., graphs, tables etc.)? [If appropriate] Is referencing (both in-text and in the reference list, Harvard referencing style) and correctness of spelling & grammar ensured? Relevance of the findings to social work practice. Do the findings relevant to contemporary social, economic, political and technological problems in Zimbabwe, Africa or global? Does the model have inputs, outputs and outcomes?

First Marker

Second Marker

Actual Mark

Comments:

……

……

……

8. Mark Awarded: Out of 100%

First Marker

Second Marker

Actual Mark

MARK OUT OF 100 %

50 – 100 =Pass
0 – 49 =Fail

NB: All grades are subject to amendment following internal/external moderation.

Assessment received by …….. Date stamp……

Plagiarism in assessed Coursework

A student is liable to be found guilty of plagiarism if any work presented for individual assessment is found to contain the unacknowledged work of some other person, persons or organisation. If this involves deliberate misrepresentation of material as the student's own attempt to deceive the examiner, then the offence is very grave indeed.

All sources should be cited and all quotations from the works of other authors clearly identified as such.

If a student's work is found to contain verbatim (or near verbatim) quotation from the work of other authors (including other students past or present) without clear acknowledgement, then plagiarism has been committed whether or not the student intended to deceive the examiners

---

Contents

ACRONYMS

- AA – Action Aid
- EMA – Environmental Management Agency
- COMIFAC- Central African Forest Commission
- UNICEF - United Nations International Children's Emergency Fund
- UN - United Nations
- SADC - Southern African Development Community
- SES- Social Ecological System
- FGDs - Focus Group Discussions

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Presented in this particular section is a research endeavor examining the ramifications of changes in climate on susceptible communities, focusing on the Mucheke area in Masvingo, Zimbabwe. The impact of climate change presents notable obstacles to societies globally, encompassing heightened occurrences of extreme weather phenomena, alterations in precipitation patterns, and escalating temperatures, ultimately affecting diverse facets of human existence such as agriculture, water reservoirs, and socio-economic progress. Within the Mucheke vicinity of Masvingo, Zimbabwe, the repercussions of changes in climate are conspicuous, leading to the initiation of adaptive measures. Consequently, communities are compelled to devise and execute adaptation strategies to mitigate the unfavourable consequences of climate change. The primary focus of this investigation is to assess identifiable repercussions on vulnerable communities in Zimbabwe, particularly in Masvingo, while also identifying prospective areas for enhancement.

1.1 Background of the study

“Global climate change is a change in the long-term weather patterns that characterize the regions of the world,” Mahato (2014). Globally, climate change is putting nations in crisis and is affecting everyone in terms of economy, politics and also physical challenges. By definition, the climate change phenomenon explains: “longstanding alterations in temperature and weather patterns on a global scale, primarily caused by human activities” United Nations (2023). The UN recognizes that the earth’s climate has naturally varied throughout history, but the current climate change is

of great concern due to its accelerated pace and the overwhelming evidence that human behaviour, particularly around burning of fossil fuels and damage to the ecosystem driving the changes. The impacts of climate change are multi-faced and can be observed across various sectors and aspects of human and natural systems. On a global scale, the consequences of climate change include temperatures rises, severe weather events as well as changes in precipitation patterns, disruption of ecosystem and biodiversity and impacts on agriculture, water sources and public health.

Climate change is anticipated to exacerbate existing challenges establishing new blend of risks specifically in Africa, where there is prevalent rise in poverty as well as dependence on the natural world (Ziervogel, 2009). Consequently, there is a developing demand for assertive adaptation to climate change threats. In order to accomplish this, the necessary expertise needs to be constructed on the use and application of climate knowledge to support informed decisions.

In Africa, impacts of climate change are disproportionately severe compared to other regions globally, despite the continent having the lowest levels of carbon emissions (African Parks, 2023). The primary driver of global warming and climate change is attributed to carbon discharges (African Parks, 2023). Regions such as Malawi, South Africa experience heightened occurrences of storms and rainfall, while the horn of Africa faces escalating droughts (Dungy, 2022). The agricultural practices in Sub-Saharan Africa heavily depend on rain-fed systems, with up to 95% reliance, rendering countries like Mozambique and Malawi particularly susceptible to the effects of climate change (African Development Bank, 2023). Toward achieving the Millennium Development Goals (MDGs) by 2030, Africa requires a minimum of US$3 trillion for the execution of adaptation and mitigation strategies (African Development Bank, 2023). Climate change primarily manifests in Africa through challenges such as water scarcity, and related risks (World Meteorological Organization, 2022). Detrimental impacts of climate change on Africa are

further aggravated via conflict ridden regions like Congo and Northern Region of Mozambique, , where inadequate political governance structures exacerbate the situation (African Development Bank, 2023).

Local ramifications of climate variability are prominently evident, particularly due to the nation's heavy reliance on an agriculture-centric economic model (UNICEF Zimbabwe, 2023). On a global scale, Zimbabwe holds the third position on the climate risk index (UNICEF Zimbabwe, 2023). This underscores the potential impact of climate variability on the most susceptible demographic within the nation - those residing in country side who depend on subsistence farming for their livelihoods (Mushore, et.al, 2021). Mitigation approaches to climate variability encompass communal initiatives as well as governmental measures like afforestation, fire prevention, and wetland preservation (Mushore et.al, 2021). Situated in Zimbabwe’s southern region, Masvingo District is part of the seven districts in the province, encompassing Chiredzi, Chivi, Bikita, Gutu, Zaka, and Mwenezi (Government of Zimbabwe, 2022). Within Masvingo District lies Masvingo City. Numerous research endeavors have delved into climate variability within Masvingo Province, focusing on aspects such as the absence of a structured resilience framework for Masvingo City's landscape (Mbaura, 2021), rainfall fluctuation patterns in Masvingo Province (Chikodzi, Murwendo and Simba, 2013), and the utilization of community gardens to combat climate-induced surprises in Bikita District of Masvingo Province (Muzawazi, Terblanche and Madakadze, 2017). Extensive exploration indicates a prevalent emphasis on climate variability in existing studies, albeit none specifically addressing climate adaptation in Masvingo Urban District.

The researcher, in this context, recognized the necessity of directing attention towards the evaluation of the efficiency of climate change adaptation approaches implemented in Mucheke,

Masvingo, as a singular case. It was the researcher's conviction that this study could contribute to understanding climate change adaptation methods utilised in the province as well as national level.

1.2 Conceptual Framework

The theoretical framework utilized in this research is the Social-Ecological System (SES) framework, which serves as a conceptual model for comprehending and examining the linkages between social and ecological systems within a specific setting. When evaluating the effectiveness of climate change coping measures implemented by Mucheke residents, the SES framework can offer valuable insights. This framework acknowledges that climate change adaptation is not solely determined by ecological elements but also encompasses social structures such as institutions, governance frameworks, and cultural norms. It underscores the interrelatedness and mutual reliance between social and ecological elements.

The utilization of the SES framework enables an examination of the efficacy of climate change coping mechanisms in Mucheke, through an analysis of the interplay between social and ecological systems. It facilitates an exploration of how social elements such as cultural beliefs, local knowledge, institutional arrangements, and community organization influence these strategies, and their repercussions on ecological systems encompassing natural resources, agriculture, and ecosystems.

The study is informed by the SES framework, emphasizing the necessity of considering the social milieu within which climate change adaptation strategies are executed. It acknowledges that effective adaptation relies not solely on technical remedies but also on social and institutional capabilities. Moreover, the framework promotes a comprehensive viewpoint that considers the interconnections and dynamics between social and ecological systems.

It is imperative to highlight that through the adoption of the Social-Ecological System framework, the research evaluates efficacy of climate change coping mechanisms in Mucheke, by examining the interactions between social and ecological systems and their influence on adaptation outcomes. This methodology offers a more thorough and contextual comprehension of the factors impacting adaptation, offering valuable insights to shape forthcoming approaches and policies.

1.3 Statement of the Problem

Research undertaken in this study pertains to the impact climate change has on susceptible communities like Mucheke, serving as the focal point, and the adaptation tactics embraced by the vulnerable populace in Mucheke, Masvingo. Despite the necessity of climate change adaptation for the resilience and welfare of the community, there exists a deficiency in a comprehensive grasp of the spectrum of strategies in operation, their efficacy, and the fundamental influencers affecting their adoption. This informational void hampers the creation of precise and evidence-grounded measures to bolster climate change adaptation in the district of Mucheke in Masvingo. Masvingo stands out as the hottest province in Zimbabwe, characterized by a scorching and arid climate, where temperatures frequently soar, notably throughout the summer season. Consequently, the predicament associated with climate change or global warming is anticipated to have the most severe repercussions in this province, particularly given its classification as a semi-arid region (Mbaura, 2021). Hence, it is imperative to conduct a study on the ramifications of climate change on the vulnerable community of Mucheke within such a locale, with potential for the extrapolation of findings to other regions of Zimbabwe experiencing similar warm climatic conditions.

1.4 Research Aim and Objectives

1.4.1 Research Aim

- The aim of the study was to assess effects of climate change on vulnerable community of Mucheke.

1.4.2 Research Objectives

- To identify climate change adaptation strategies adopted by the vulnerable people in Mucheke.
- To assess the efficacy of these adaptation strategies towards enhancing community resilience.
- To explore challenges that are being faced with regards to adaptation strategies implementation.
- To provide recommendations for reduction of effects of climate change on vulnerable community of Mucheke.

1.5 Research Questions:

The research questions guiding this study are as follows:

- What are the effects of climate change on vulnerable community of Mucheke, Masvingo?
- Are the adaptation strategies being employed to enhance resilience of the community showing effectiveness?
- What are the factors possibly influencing success of these adaptation strategies?
- What are the challenges faced in the implementing the strategies?

- What recommendations can be made to for reduction of effects of climate change on vulnerable community of Mucheke?

1.6 Assumptions of the Study

When investigating the effects of climate change on the vulnerable Mucheke community in Masvingo, it is necessary to consider several underlying assumptions. These assumptions may be speculative and could vary depending on the specific objectives and research methods used in the study. Some of the key assumptions that were factored into the investigation include:

- Climate Change Awareness: It was presupposed that the individuals residing in Mucheke possess a foundational comprehension and consciousness of climate change, its underlying causes, and its potential ramifications. Without this fundamental awareness, it becomes arduous for community members to embrace adaptation measures.

- Availability of Adaptation Strategies: The assumption was made that there exists a range of climate change adaptation strategies that are within reach and accessible to the residents of Mucheke. These strategies encompass both traditional and contemporary approaches, with the underlying belief that individuals have the capacity to access and utilize these strategies effectively.

- Resources and Infrastructure: It is postulated that the residents of Mucheke possess the requisite resources and infrastructure essential for the successful implementation of climate change adaptation strategies. These encompasses finances, technology, and pertinent

institutions or organizations support. The working assumption was that individuals can procure as well as employ these assets effectively.

- Government Support and Policy Frameworks: Was posited that Masvingo's provincial local government and relevant authorities in Mucheke have established supportive frameworks and policies aimed at fostering as well as facilitating climate change adaptation endeavours.

1.7 Significance of the study

This study holds significant importance for several reasons:

- It offers a comprehensive comprehension of effects of climate change on vulnerable communities, contributing to the knowledge base on community-level adaptation practices.
- The findings will help identify successful adaptation strategies and best practices that can be replicated in other vulnerable communities, fostering knowledge sharing and cross-learning.
- The study aims to identify socio-economic, institutional, and environmental factors that impact adaptation strategy selection and implementation in Mucheke.
- Identifying community barriers and challenges will inform strategies to improve long-term sustainability of climate change.
- The study's participatory method, which includes the community in the assessment process, will build a sense of ownership and empowerment among local stakeholders, promoting the long-term viability and efficacy of adaptation measures.

1.8 Delimitation of the Study

Research was confined to the effects of climate change on vulnerable community of Mucheke. Thus the focus of the study assessed the effect of climate change on the vulnerable community of Mucheke, Masvingo. Mucheke, a community located in Masvingo, Zimbabwe. Research only fixated on the effects of climate change on vulnerable community of Mucheke.

1.9 Limitations of the study

While qualitative data through semi-structure questionnaires, interviews and observations, offers valuable insights into the topic of the effects of climate change on vulnerable community of Mucheke, Masvingo, there are several limitations that the research faced:

1.9.1 Generalizability

The findings unearthed through qualitative research were limited to specific circumstances and could not be easily generalised to other localities. The inquiry focused on a certain geographical region, failing to reflect the perspectives and insights of people in different regions or cultural contexts.

1.9.2 Sampling Bias

The utilization of purposive and convenience sampling by the research introduced selection bias, as participants were selected based on their actual relevance to the research inquiries. This constrained the variety and representativeness of the sample, potentially neglecting certain perspectives or experiences.

1.9.3 Subjectivity and Interpretation

Investigators' interpretation and analysis are critical components of qualitative research. The researcher's own history, prejudices, and preconceived notions influenced data collecting, coding, and theme development. Even in light of efforts at maintaining objectivity, subjective assessments continued to impact the results.

1.9.4 Limited Sample Size

Qualitative inquiry often involves a small sample size, particularly in investigations aiming for data saturation. While this allowed for a detailed study, it did not capture the full range of experiences and viewpoints within the target group.

1.9.5 Social Desirability Bias

Certain participants offered responses that they deemed socially acceptable or aligned with societal standards. This resulted in the underreporting of delicate matters or biased portrayals of experiences, potentially compromising the credibility of the outcomes.

1.10 Definition of key words

1.10.1 Assessment

For this proposed study assessment mean “a process for documenting, in measurable terms, the knowledge, skills, attitudes and beliefs of the learner” Poehner (2007).

1.10.2 Effectiveness

“Effectiveness can be described as the extent to which the desired level of output is achieved” (Global Dictionary, 2022).

1.10.3 Climate change

"Global climate change is a change in the long-term weather patterns that characterize the regions of the world" (Mahato, 2014).

1.10.4 Adaptation strategies

An adaptation strategy is "a program, project or approach that has been developed to respond to anticipated climate change impacts in a specific area of potential concern" (Environmental Resilience Institute, 2023).

1.11 Structure of the Study

Chapter 1: Introduction

The backdrop of the investigation, the problem statement, the research objectives, inquiries, the significance of the research, the delimitations and assumptions, the purpose of the investigation, and the definition of significant terminology are all encompassed in this section.

Chapter 2: Literature Review

The chapter scrutinizes pertinent literature on interconnected research. A literature review involves a comprehensive recapitulation of previous studies on a specific topic (Fletcher, 2021). As per Kraft (2018), a literature review scrutinizes academic publications, journals, and other pertinent materials related to a specific research topic. The antecedent research must be listed, summarized, critically assessed, and elucidated in the review. This chapter will address climate change and its repercussions, climate change adaptation, adaptation strategies in rural communities, factors that influence adaptation efficacy, as well as knowledge gaps and research requirements.

Chapter 3: Methodology

This chapter elaborates on the research methodology, methodologies, sampling techniques, and research tools utilized in the study, along with the study area, which is Mucheke in Masvingo.

Chapter 4: Data Presentation, Analysis and Interpretation

The fourth section expounds on data scrutiny and its exhibition. The collected data was examined by the researcher to recognize patterns and significance. This section displayed the compiled data and the interpretation of the findings. The analyzed data was illustrated as main themes and sub-themes. This chapter examines the influence of climate change on the vulnerable community of Mucheke, an overview of the community, the identification and description of adaptation strategies and their implementation process, as well as stakeholder engagement.

Chapter 5: Summary, Conclusion and Recommendation

The last chapter encapsulates a summary of findings, conclusions, and recommendations pertaining to the investigation. The chapter will recapitulate how the research was conducted alongside the study's findings. This section aims to evaluate the efficacy of adaptation strategies, criteria for effectiveness, and the strengths and weaknesses of adaptation strategies.

1.12 Chapter Summary

This chapter introduced a study that aimed to evaluate the impact of climate change on the vulnerable community of Mucheke, Masvingo. It delineated the study's background, problem statement, significance, research goals and objectives, research inquiries, research presumptions, study limitations, and the definition of critical terms, as well as the structure of the study. The subsequent chapter, concentrates on the literature review.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The section identifies and analyses existing studies on the effects of climate change on vulnerable community of Mucheke, Masvingo. Aspects to be discussed will cover the effects of climate change on vulnerable communities globally, regionally and at national level.

2.1 Theoretical Framework

2.1.1 Diffusion of innovation theory

Everett Rogers' diffusion of innovation theory explains how new ideas, goods, or practices spread and get embraced within a society or group of people (Dungy, 2022). The theory proposes that adoption occurs in five stages: knowledge, persuasion, decision, implementation, and confirmation. The diffusion of innovation theory can provide useful insights into the effectiveness of climate change adaptation techniques chosen by the inhabitants of Mucheke, Masvingo (Climate Change Knowledge Portal, 2023). According to Dungy (2022), this theory contributes to an understanding of how and why specific adaptation tactics are accepted or rejected by communities. By applying the theory, you can examine the different stages of the diffusion process in relation to the effects of climate change on vulnerable community of Mucheke, Masvingo.

Firstly, the knowledge stage involves understanding which adaptation strategies are available and known to the community. Next, the persuasion stage looks at how the community is convinced or persuaded to consider adopting specific adaptation strategies. This involves studying the influential factors and channels that motivate individuals in Mucheke, Masvingo to embrace climate change adaptation measures. The decision stage focuses on how the community makes choices regarding the adoption or rejection of certain strategies. Understanding the decision-making process can shed light on factors such as perceived benefits, costs, social norms, and external influences.

The implementation stage examines the actual adoption and implementation of the adaptation strategies. It is crucial to assess the extent to which the community effectively follows through on the chosen strategies, as this impacts the overall success of climate change adaptation (Climate Change Knowledge Portal, 2023). Lastly, the confirmation stage evaluates the outcomes and effectiveness of the adopted strategies. This stage is especially important for your study, as it aims to assess the effectiveness of climate change adaptation mechanisms used by residents in Mucheke.

By utilising the diffusion of innovation theory, the research acquired a comprehensive knowledge of the effects of climate change on vulnerable community of Mucheke, utilized, and perceived within the community. This information will inform research design, data collection methods, and analysis, allowing the research to effectively assess the effects of climate change on vulnerable communities.

2.2 Preliminary Literature Review

The literature review aims to examine previous research related to the effects of climate change on vulnerable community of Mucheke, Masvingo. This view critically analyses existing literature, identifies gaps, and highlights the significance of the current study in addressing those gaps.

2.2.1 The Effects of Climate Change on Vulnerable Communities Globally.

This study examines the current state of knowledge on climate change adaptation strategies at global, regional, and national levels, with a specific focus on the Masvingo region. The primary goal of this review was to identify, assess, and critically evaluate existing adaptation measures across different scales. The findings suggest that countries worldwide are adopting a wide range of climate change adaptation strategies. These approaches combine both policy-oriented initiatives, such as developing national adaptation plans, and practical interventions, including sustainable land use, disaster risk management, and ecosystem-based adaptation. Globally, key efforts include transitioning to renewable energy, mitigating greenhouse gas emissions, and enhancing infrastructure resilience to extreme weather events. Common adaptation strategies observed globally include improving early warning systems, investing in climate-resilient infrastructure, integrating climate considerations into urban planning, building local community

resilience through capacity-building initiatives, and mobilizing climate finance to support adaptation efforts in developing countries. Governments, international organizations, and non-governmental entities are actively working together to implement these adaptation approaches in practice.

Across Africa, climate change adaptation strategies are being implemented at the continental, regional, and national levels, as noted by Nilson and Hammer (2016). The African Union and regional bodies, such as the African Development Bank, have launched various initiatives and projects to support adaptation efforts, including capacity building, technology transfer, financial aid, and research and development projects, as highlighted by Smit and Wandel (2016). In response to climate change, African countries are adopting measures to improve water resource management, enhance food security, and strengthen community resilience. For instance, in Kenya, the government is promoting the use of indigenous knowledge and traditional agricultural practices to enhance resistance to climate change (Mushore et al., 2021). In Ethiopia, the government is investing in water conservation and irrigation infrastructure, as well as promoting sustainable land management methods (United Nations, 2023). Similarly, in Malawi, the government is supporting the cultivation of drought-resistant crops, improving food storage and delivery systems, and investing in early warning mechanisms. These are just a few examples of the numerous projects being implemented across Africa to adapt to climate change.

The Southern African Development Community (SADC) has recognized the urgency of adapting to climate change and has established a regional framework to address this challenge (Mbaura, 2021). This framework aims to promote sustainable development and resilience in the region by integrating adaptation strategies across various sectors, including agriculture, water resources, energy, and healthcare (Mbaura, 2021). These measures are designed to assist communities in

adapting to climate change, mitigating their vulnerability to its impacts, and advancing sustainable development practices (Mbaura, 2021).

One notable example of climate change adaptation in Southern Africa is the ongoing initiatives in the Limpopo River Basin, which spans across South Africa, Zimbabwe, and Mozambique and is particularly susceptible to the consequences of climate change (Mbaura, 2021). The Limpopo River Basin Watercourse Commission has developed a climate change adaptation strategy that prioritizes improving water management, ensuring food security, and preserving ecosystems, with specific projects encompassing small-scale irrigation systems, rainwater harvesting, and community gardens (Mbaura, 2021).

In response to the urgent need for climate change adaptation, the government of Zimbabwe has integrated this concern into its national policies and plans, as argued by Chapungu and Nhamo (2016). This commitment is evident in the National Climate Change Response Strategy and the Zimbabwe National Climate Change Policy. Madzudzo (2017) underlines the creation of various institutional structures and projects in the country to bolster adaptation efforts, such as the Climate Change Management Department and the Climate Change Adaptation Fund.

At the local level, Masvingo has implemented specific adaptation strategies to address climate change impacts, including agricultural techniques like conservation farming, crop diversification, and irrigation projects. Additional strategies involve water resource management, forest conservation, and sustainable livelihood practices to enhance community resilience. Regrettably, the Cyclone Idai tragedy that struck Chimanimani and Chipinge in 2019, as noted by Kajongwe (2022), remains one of Zimbabwe's most devastating climate-related disasters, causing extensive infrastructure damage, fatalities, and mass displacement.

In response to this catastrophe, the government has implemented diverse adaptation measures, such as providing emergency shelters, food aid, infrastructure rehabilitation, and enhancing early warning systems. To foster resilience, efforts are also being made to improve the management of natural resources, such as forests and water reservoirs, thereby reducing the risk of future disasters and safeguarding people's livelihoods. For instance, in Matabeleland, the government and communities are collaborating to enhance water management, promote sustainable agriculture, and increase access to climate-resilient housing (Mushore et al., 2021). Likewise, initiatives in the Midlands province aim to improve water harvesting, repair damaged infrastructure, and promote sustainable agricultural practices. In the Mashonaland provinces, the government is working to enhance access to clean water, improve land use planning, and establish drought-resistant agriculture. These are just a few of Zimbabwe's various climate change adaptation initiatives.

These strategies encompass a spectrum from policy frameworks to practical interventions, indicating the acknowledgment of the necessity to enhance resilience and mitigate susceptibility to the impacts of climate change. However, further investigation and assessment are required to appraise the efficacy of these strategies, recognize optimal approaches, and tackle any deficiencies or obstacles. The upcoming dissertation aims to contribute to this research agenda by conducting a thorough evaluation of the climate change adaptation strategies implemented in Masvingo, Zimbabwe. The outcomes will offer valuable insights for policymakers, practitioners, and local communities in formulating and executing efficient climate change adaptation strategies.

2.2.2 Effectiveness of Climate Change Adaptation Strategies in Enhancing the Resilience of Communities

This study presents a comprehensive review of the existing academic literature on the effectiveness of climate change adaptation techniques in enhancing community resilience. The primary objective of this review is to assess the outcomes and successes of various adaptation strategies implemented globally, with a focus on Africa, the Southern African Development Community (SADC), and Zimbabwe. The review aims to identify effective approaches, pinpoint limitations and obstacles, and highlight areas that require further exploration. As noted by Elliot et al. (2011), climate change adaptation measures have demonstrated varying degrees of success in promoting community resilience. For instance, nature-based solutions such as ecosystem-based adaptation and sustainable land management have been shown to offer numerous benefits, including biodiversity conservation, improved food security, and reduced vulnerability to climate-related hazards. However, as highlighted by Klein et al. (2021), the implementation of these strategies is hindered by challenges such as insufficient funding and institutional barriers.

Globally, numerous instances exist of triumphant climate change adaptation endeavors. In the Netherlands, for instance, the administration has enforced a comprehensive flood control system encompassing the deployment of dikes, storm surge barriers, and other mechanisms to safeguard against coastal flooding (Denchak and Turrentine, 2021). This system has effectively curbed the risk of flooding in the Netherlands, resulting in the preservation of numerous lives and properties. Furthermore, many nations have introduced national adaptation blueprints concentrating on diverse domains like agriculture, water resource management, disaster risk mitigation, and healthcare (World Meteorological Organization, 2022). According to Denchak and Turrentine (2021) they contend that these schemes are presently under evaluation, exhibiting some encouraging outcomes. Another illustration is the utilization of mangrove forests to shield coastal regions from storm surges and rising sea levels. Essman (2022) observes that mangroves furnish a

natural barricade capable of attenuating the impact of waves and storm surges, thereby safeguarding coastal populations. This tactic has achieved success in locations like Thailand, where mangrove forests were cultivated subsequent to the 2004 tsunami to shield coastal settlements. Similarly, in Bangladesh, a blend of mangrove rehabilitation and community-centered disaster preparedness is acknowledged with rescuing numerous lives during recent cyclones.

In China, an array of measures has been enacted to adapt to climate change, inclusive of the erection of extensive reservoirs and dams, like the Three Gorges Dam, to mitigate flooding occurrences and enhance water availability. Essman (2022) highlights that China has engaged in efforts to enhance its water management system by constructing irrigation canals and advocating for rainwater harvesting. Similarly, various nations, including Australia, have initiated extensive water management schemes to bolster their capacity to withstand the effects of climate change. Moreover, numerous countries have formulated comprehensive national strategies for climate change adaptation, encompassing measures to enhance food security, water resource governance, and readiness for disasters (Mushore et al., 2021). Within the United States, the National Climate Assessment (NCA) has devised a range of adaptation tactics for different geographical areas. Notably, the NCA proposes safeguarding coastal populations against storm surges and rising sea levels by employing living shorelines, a blend of natural and engineered solutions to mitigate storm impacts (World Meteorological Organization, 2022). Additional strategies entail fortifying infrastructure against extreme weather events and escalating the utilization of sustainable energy sources (United Nations, 2023). Furthermore, the NCA advocates for enhancing readiness for droughts through intensified water preservation and efficiency, alongside the development of water management strategies.

Madzudzo (2017) contends that in Africa, adaptation measures have exhibited promising outcomes in fortifying resilience and diminishing susceptibility to climate change repercussions. For example, small-scale farmers have adopted techniques like agroforestry, micro-irrigation, and crop diversification to amplify agricultural productivity and adjust to evolving climatic circumstances. Additionally, Chapungu and Nhamo (2016) assert that community-oriented adaptation methodologies, such as establishing early warning systems, have enhanced disaster preparedness and response capabilities. Mbaura (2021) argues that in West Africa, the West African Science Service Center on Climate Change and Adapted Land Use (WASCAL) has been dedicated to enhancing countries' capacity to confront climate change. This involves initiatives aimed at enhancing water management, agriculture, and disaster readiness. In East Africa, the Intergovernmental Authority on Development (IGAD) has crafted an integrated regional blueprint for climate change adaptation, concentrating on water governance, agriculture, energy, healthcare, and disaster risk management. The African Development Bank (2023) reports that in Central Africa, the Central African Forest Commission has been active in formulating a plan to curtail deforestation and forest deterioration, significant contributors to climate change. This plan encompasses the promotion of sustainable forest stewardship, augmentation of forest conservation efforts, and backing sustainable farming practices. Moreover, the commission has endeavored to enhance communities' resilience to climate change through initiatives like the "Climate-Smart Villages" program, designed to enhance food security and adaptive capacity in rural settings.

Lake Chad Basin Commission has been striving to enhance water governance and safeguard the ecosystem surrounding Lake Chad. The commission is also committed to enhancing the livelihoods of lakeside communities through undertakings such as sustainable fishing and farming endeavors (Mushore et al., 2021). The commission is actively involved in mitigating the impact of

natural calamities like droughts and floods through the implementation of "early warning systems" and disaster preparedness strategies. In the Sahel region, a number of strategies to adapt to climate change, had been adopted these include improving early warning systems (Dungy, 2022).

Hammer (2016) asserts that the execution of strategies aimed at adapting to climate change in the SADC region has yielded positive outcomes for enhancing community resilience. Smit and Wandel (2016) observe that regional endeavours, such as capacity enhancement initiatives and platforms for sharing knowledge, have bolstered adaptive capabilities and promoted cooperation among member nations. Nevertheless, obstacles persist, encompassing the necessity for enhanced integration of adaptation measures into domestic policies and the fair allocation of resources. In areas of Southern Africa beyond Zimbabwe, various climate change adaptation approaches are evident. For instance, in Malawi, a National Adaptation Programme of Action (NAPA) has been devised by the government to tackle the effects of climate change on the nation's agricultural, water, and health sectors (African Development Bank, 2023). Zambia, on the other hand, has formulated a national climate change policy to steer adaptation and mitigation endeavours. Similarly, Mozambique has crafted a National Adaptation Plan (NAP) to bolster adaptation initiatives at different administrative levels, while Namibia has established a National Climate Change Response Policy and a National Climate.

Expanding on the Southern African setting, South Africa has developed a National Climate Change Response White Paper that outlines a framework for adaptation and mitigation. Furthermore, Mbaura (2021) claims that South Africa has implemented a National Adaptation Strategy, which includes measures to improve water resource management, agriculture, disaster preparedness, and other areas. South Africa has also emerged as a leader in renewable energy development, with Africa's largest renewable energy project. These examples are only a portion

of the vast range of adaptation tactics being used in Southern Africa (Mushore et al., 2021). Lesotho, for example, has developed a National Climate Change Policy and Action Plan. The policy articulates aspirations to diminish susceptibility to climate change, advance sustainable growth, and fortify the resilience of communities and ecosystems.

Moreover, as outlined by Kajongwe (2022), the plan incorporates measures to enhance water management, agriculture, energy, and other sectors. A pivotal initiative within the plan is the establishment of a National Drought "Early Warning System" in Lesotho, devised to aid farmers and communities in readiness for and response to drought situations. In Lesotho, the government has devised a policy and plans. Mbaura (2021) contends that the policy delineates objectives to lessen vulnerability to climate change, foster sustainable development, and enhance the resilience of communities and ecosystems. Additionally, the plan encompasses actions to enhance water resource management, agriculture, energy, and other sectors. A central feature of the plan is the establishment of a National Drought "Early Warning System" to assist farmers and communities in preparing for and addressing drought occurrences.

Mudombi-Rusinamhodzi, et al. (2012) elucidate that in Zimbabwe, the efficacy of climate change adaptation strategies in bolstering community resilience is apparent across diverse sectors. An illustration of this is the adoption of sustainable agricultural methodologies, such as conservation agriculture and the cultivation of drought-resistant crops, which has enhanced both food security and income generation. Initiatives in water resource management, such as rainwater harvesting and small-scale irrigation projects, have similarly augmented water availability in arid regions. Chapungu and Nhamo (2016) contend that at a local level in Masvingo, numerous adaptation approaches have demonstrated favorable outcomes in fortifying community resilience. Notably, the formation of community-based organizations and cooperatives has reinforced collective action

and facilitated the exchange of knowledge. Interventions centered on agriculture, such as farmer field schools and the advocacy of climate-smart practices, have resulted in heightened agricultural productivity and diversified income streams.

Evaluating the effectiveness of strategies for adapting to climate change is a multifaceted and continuous undertaking. Nonetheless, Essman (2022) has ascertained that the measures being executed in Zimbabwe are yielding positive outcomes. For instance, the utilization of climate-resilient seeds and agricultural techniques in the Midlands province has led to amplified crop yields and enhanced food security for certain farmers. Furthermore, enhanced water resource management in the Matabeleland region has resulted in increased water availability for both agricultural and domestic purposes (African Development Bank, 2023). Nevertheless, there remains a necessity for further research and monitoring to comprehensively assess the efficacy of these strategies (Muzawazi, et al. 2017). One of the primary challenges confronting Zimbabwe is the ramifications of climate change on agriculture, a pivotal sector of the economy. In response, the government has formulated a National Climate Change Response Strategy encompassing measures to promote sustainable agriculture, enhance disaster management, and fortify food security. This strategy also encompasses the establishment of a National Drought Task Force, which strives to coordinate actions to address drought and enhance resilience (Mushore et al., 2021).

Moreover, Zimbabwe is enacting several specific initiatives to tackle climate change, including a "climate-smart" agricultural scheme and a REDD+ program. UNICEF Zimbabwe (2023) highlights that a fundamental tenet of the climate change response strategy in Zimbabwe is the advocacy of renewable energy. In pursuit of this objective, the government has devised a Renewable Energy and Energy Efficiency Strategy and Action Plan with the aim of augmenting

the proportion of renewable energy sources in the nation's energy portfolio. This encompasses the utilization of solar, wind, and hydroelectric power.

The government is additionally advocating for the adoption of energy-efficient appliances and technologies. Furthermore, there are plans to implement climate-resilient infrastructure and technologies across a variety of industries, including agriculture, healthcare, and water supply. An element of the climate change response strategy in Zimbabwe is the promotion of disaster risk reduction, entailing reinforcing early warning systems, enhancing disaster preparedness, and bolstering resilience to extreme weather occurrences (Muzawazi, et al. 2017). The government is also actively engaged in enhancing community capacities to respond to disasters and ensuring the inclusion of vulnerable groups such as women and children.

Based on the preliminary review of knowledge, the efficacy of climate change adaptation strategies in bolstering community resilience has exhibited varying degrees of success on a global scale, particularly in Africa, the SADC region, Zimbabwe, and Masvingo. Although certain approaches have yielded positive results, persistent obstacles such as resource constraints, institutional hindrances, and the necessity for better integration of adaptation measures into policies continue to exist (Mushore et al., 2021). Further investigation is imperative to comprehensively assess the enduring impacts of these strategies, recognize optimal methodologies, and tackle emerging difficulties. The forthcoming thesis aims to contribute to this research agenda by conducting an extensive evaluation of the efficacy of climate change adaptation strategies in enhancing community resilience in Masvingo, Zimbabwe.

2.2.3 The factors influencing the success of these adaptation strategies

2.2.3.1. Political will and International cooperation and support

The dedication and investment of state governments and development partners in prioritizing adaptation strategies significantly impacts their effectiveness. Essman (2022) emphasizes that sufficient political determination and robust leadership can facilitate the formulation and execution of efficient adaptation blueprints. Mbaura (2021) contends that resolute political will can lead to the development of effective policies, allocation of resources, and harmonization among diverse sectors. The World Meteorological Organisation (2022) asserts that strong governance and supportive policies are required for effective adaptation efforts.

In Zimbabwe, the government developed the National Climate Policy and the National Climate Change Response Strategy, laying the framework for climate adaptation efforts. Mbaura (2021) argues that international cooperation, financial support, and technological distribution are critical to the success of adaptation initiatives. The amount to which the global community provides assistance, including financial aid, technical support, and capacity building, can have a significant impact on the efficacy of African adaptation initiatives. Multilateral collaboration, technology exchange, and knowledge dissemination among African countries and international allies can boost the effectiveness of adaptation strategies.

Mushore et al. (2021) emphasize that integrating adaptation measures into larger development plans and policies can increase their effectiveness. Ensuring deliberate alignment with existing social, economic, and environmental development goals helps to prioritize adaptation efforts. Cooperation among multiple stakeholders, including governments, non-governmental organizations, communities, and the corporate sector, is critical to the effectiveness of adaptation efforts. Substantial participation ensures that the needs and perspectives of many groups are considered during the planning and execution phases. Effective collaboration between SADC

countries and global partners, such as technology transfer and knowledge sharing, has the potential to improve the effectiveness of regional adaptation initiatives.

2.2.3.2. Financial resources

The availability and allocation of financial resources are pivotal in determining the success or failure of adaptation strategies. Adequate funding for research, planning, and implementation is imperative for the efficient execution of adaptation measures. Socio-economic factors like poverty, inequality, and educational levels significantly influence the outcomes of adaptation strategies in Africa. Elevated poverty levels may restrict access to essential resources and services, while inequality can worsen susceptibilities to climate change impacts. The presence and distribution of financial resources for adaptation initiatives are critical factors influencing their outcomes in Africa. Scarce financial resources, both domestically and internationally, may impede the execution of adaptation measures and constrain their effectiveness. Southern Africa nations encounter socio-economic obstacles such as poverty, inequality, and limited educational access, which can impede the triumph of adaptation strategies by constraining communities' ability to address climate change impacts and acquire essential resources for adaptation measures.

Limited financial resources could pose a barrier to the successful implementation of adaptation strategies in Southern Africa nations. Inadequate funding, whether from domestic or international sources, could hinder the execution of adaptation strategies and curtail their impact at national and local levels. Economic challenges and poverty may obstruct the implementation of adaptation strategies. As illustrated by Kajongwe (2022), in regions like the Mwenezi District, where agriculture is predominant, farmers may struggle to afford climate-smart technologies like drip irrigation systems, thereby affecting their adaptive capacity to water scarcity. Sufficient financing

and access to pertinent technologies are pivotal for the implementation of adaptation strategies. Organizations like Practical Action provide technical assistance and grants to smallholder farmers in regions like Masvingo Province for climate-smart practices, including water harvesting and preservation techniques.

2.2.3.3. Capacity building and technical expertise

The presence of skilled professionals is crucial for the development, implementation, and monitoring of adaptation measures. As Muzawazi et al. (2017) emphasize, training programs and capacity-building initiatives can significantly enhance the effectiveness of adaptation efforts. The efficacy of Africa's institutions and governance systems is vital to the success of adaption methods. Institutional capabilities, including responsive policy frameworks, effective planning procedures, and intergovernmental cooperation, are essential for the implementation and monitoring of adaptation strategies, as highlighted by Mushore et al. (2021).

In Southern African countries, the efficacy of institutions and governance systems is critical to the success of adaptation initiatives. Adequate institutional capacity, including responsive policy frameworks, effective planning procedures, and intergovernmental coordination, is necessary for the implementation and monitoring of regional adaptation strategies. Access to and adoption of suitable technology are critical to successful adaptation in Southern Africa. Enhancing technological capabilities, such as access to climate data, early warning systems, and energy-efficient devices, can bolster the effectiveness of regional adaptation efforts. The availability of local resources and the ability to carry out adaptation measures are crucial for the region's adaptation efforts.

2.2.3.4. Environmental considerations

The vulnerability of African ecosystems to the effects of climate change, including biodiversity loss, desertification, and water scarcity, must be taken into consideration while creating adaptation strategies. Communities' resilience may be increased by using ecosystem-based strategies like repairing damaged landscapes and encouraging sustainable agricultural methods. Kajongwe (2022) asserts that effective governance frameworks and institutions are necessary for the effective application and oversight of adaptation strategies. Ensuring the success of adaptation programs necessitates collaboration and coordination among institutions at all levels, including local, regional, and national. With the exception of Zimbabwe, the countries of Southern Africa are particularly susceptible to the negative effects of climate change, including droughts, floods, and desertification. Resilience and effectiveness in addressing the effects of climate change can be increased by considering the region's particular environmental challenges when developing adaption strategies, such as promoting sustainable land and water management practices.

2.2.3.5. Social and cultural factors

Societywide acceptance and engagement can have an impact on the effectiveness of adaption measures. Promotion of community awareness and involvement in processes to do with decision-making creates a favourable atmosphere for adaptation projects. The acceptance and success of adaptation techniques in Africa can be influenced by social norms, cultural practices, and indigenous perceptions of climate change. To improve acceptance and efficacy of adaptation methods, ensure congruence with indegenious knowledge systems, and community priorities (Muzawazi et al. 2017). Social norms, traditional practices, and perceptions of climate change can all have an impact on Southern Africa's adaptation tactics. By integrating efforts with local values, knowledge systems, and community priorities, adaptation methods can be made more acceptable and effective. Traditional knowledge and social cohesion both contribute to successful adaptation.

The Chikukwa Ecological Land Use Community Trust in Chipinge District supports agroecology methods and indigenous knowledge to help smallholder farmers improve their climate resilience.

2.2.3.6. Scientific knowledge and research

According to Kajongwe (2022), access to current scientific knowledge and research on climate change consequences and adaptation alternatives is critical for developing effective strategies. Timely and accurate information can help improve decision-making and boost the chances of effective adaption. The use of appropriate technologies is critical to the effectiveness of adaption efforts. Inadequate technological capability, such as limited access to climate information, early warning systems, and energy-efficient technology, can impede the success of adaptation efforts in Africa (Muzawazi et al. 2017). The transmission of precise and relevant knowledge and information on climate change consequences and adaptation alternatives is critical for successful adaption strategies. Access to scientific data, local knowledge, and best practices in adaptation can help influence decision-making and increase the effectiveness of adaption strategies in Africa (Mushore et al, 2021).

Different regions have varying levels of susceptibility and adaptability, which are determined by factors such as geographical location, natural resources, infrastructure, and economic conditions. Customising adaption strategies to specific situations increases the likelihood of success. The development of precise and relevant knowledge and information about climate change consequences and adaptation options is critical for effective adaptation in Southern Africa (Muzawazi et al. 2017). The creation of local knowledge and the exchange of best practices can help to inform decision-making and increase the effectiveness of adaption measures in the region. Access to accurate climate data and knowledge enables communities to make educated decisions.

Non-governmental organisations (NGOs), like the Zimbabwe Environmental Law Association (ZELA), assist communities in mining-affected areas, such as Mutare and Shamva, in comprehending climate-related risks and formulating adaptation strategies.

2.2.4 The challenges Faced in the Implementation of Climate Change Adaptation Strategies

This article provides an initial review of the current research on the challenges encountered in the implementation of climate change adaptation techniques. The goal of this literary analysis is to identify and evaluate the key barriers and impediments to the successful implementation of these tactics. The study aims to provide insights into the elements that determine the effectiveness of adaptation measures adopted internationally, in Africa, the Southern African Development Community (SADC), Zimbabwe, and specifically in Masvingo.

2.2.4.1. Institutional and Governance Challenges:

Elliot et al. (2011) argue that a fundamental difficulty identified in the research is a lack of institutional capabilities and weak governance frameworks for climate change adaptation. According to Madzudzo (2017), poor coordination and collaboration among multiple stakeholders, including governments, local communities, and non-governmental organisations, impedes the successful implementation of adaptation plans. Scarce funding, restricted access to resources, and inadequate policy structures further compound the institutional challenges. The inadequacy of institutional capacities and coordination among pertinent government departments, local authorities, and stakeholders is undermining the execution of adaptation strategies (Muzawazi, et al. 2017). This is impeding the efficient planning, execution, and monitoring of adaptation activities at different levels. The protracted discussion on this challenge is predominantly due to financial shortages. According to Munyama (2022), sufficient funding is essential for the

implementation of adaptation strategies, yet there is frequently an absence of financial resources allocated to climate change adaptation endeavors. This constraint is impeding the execution of indispensable actions and restricting the scope and efficacy of adaptation endeavors.

2.2.4.2. Socio-economic Challenges:

The implementation of climate change adaptation solutions is often hindered by socioeconomic barriers at the local level. These obstacles can include limited financial resources, restricted access to credit and insurance schemes, and inadequate technical expertise (Muzawazi et al., 2017). Additionally, factors such as poverty, inequality, and limited livelihood options can impede communities' ability to adopt and maintain adaptation strategies, particularly in resource-constrained areas (Muzawazi et al., 2017). For example, small-scale farmers in Zimbabwe may lack the financial capacity to invest in climate-resilient agricultural practices or technologies due to poverty and limited access to resources (Munhuweyi, 2017).**2.2.4.3. Knowledge and Information Gaps:**

According to Chapungu and Nhamo (2016), information gaps pose significant challenges in implementing climate change adaptation measures. Inadequate understanding of local climate impacts, limited data availability, and knowledge and education deficiencies regarding adaptation methods all hinder the implementation and scaling of effective strategies. The lack of localized and context-specific knowledge impedes the identification of appropriate adaptation alternatives for certain groups. Munhuweyi (2017) further argues that a lack of awareness and understanding of climate change and its consequences in Zimbabwe impedes the proper implementation of adaptation plans. For instance, in many rural areas of Zimbabwe, there is a dearth of information

on climate change and its associated hazards, which makes it difficult to prioritize and implement adaptation actions.

2.2.4.4. Technology and Infrastructure Challenges:

Factors like limited technology and inadequate infrastructure often hinder the effectiveness of efforts to adapt to climate change. Research has shown that restricted access to climate-resilient technologies, such as drought-resistant crops, renewable energy, and weather forecasting tools, limits communities' ability to adapt (Madzudzo, 2017). Additionally, insufficient infrastructure like transportation networks, storage facilities, and water/sanitation systems presents significant challenges to successfully implementing adaptation strategies (Nilsson & Hammer, 2018). Madzudzo (2017) emphasizes that access to appropriate technology and expertise is crucial for effective adaptation measures in Zimbabwe. However, the lack of access to climate-smart technologies and technical assistance in Zimbabwe hinders the implementation of suitable community-level adaptation approaches.

2.2.4.5. Policy and Political Challenges:

Effective climate change adaptation requires political intent and supportive policies, as emphasized by Klein et al. (2021). However, the implementation of adaptation solutions is often hindered by policy and political problems, including competing agendas, policy inconsistencies, and inadequate integration of climate change considerations into development efforts (Smit & Wandel, 2016). In Zimbabwe, inconsistent government commitment, lack of administrative assistance, and inadequate political will further impede progress (Pachiti, 2023). Moreover, political instability, changes in government leadership, and policy fluctuations hinder long-term planning and implementation of adaptation methods.

The preliminary literature review revealed numerous barriers to the successful implementation of climate change adaptation techniques, including socio-economic constraints, institutional and governance barriers, knowledge and information gaps, and policy challenges. Overcoming these obstacles is crucial for enhancing the effectiveness of adaptation methods in mitigating the impacts of climate change. This dissertation aims to investigate the specific challenges encountered during the implementation of climate change adaptation measures in Masvingo, Zimbabwe, with the goal of providing valuable insights and recommendations for overcoming these hurdles.

2.3 Chapter Summary

This section presented literature review on the effects of climate change on the vulnerable community of Mucheke, Masvingo. The literature review focuses on climate change challenges, its effects, and the global and regional adaptation solutions applied. The following chapter will present the research technique.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0. Introduction

This chapter outlines the research methodology, encompassing the research approach and design. It details a comprehensive research plan, including the identification of the target population, the proposed sample selection, and the data collection and analysis methods. The chapter concludes with a discussion of ethical considerations relevant to the research.

3.1 Research Methodology

The study took a methodological approach that is said to be concerned with evaluating a perceived

Reality or phenomenon (Edwards and Skinner, 2009) which in the context of this study is the use of technology in disability sport for Zimbabwean athletes. The methodological perspective introduces positivism, post-positivism and interpretivism (Gratton and Jones, 2010). Positivism constitutes a scientific approach to research and is often associated with quantitative research approaches. The study is often conducted in controlled environments and may constitute an analysis to test a given hypothesis (Edwards and Skinner, 2009). Post-positivism is largely argued to be similar to positivism, the differences however are quite significant. Gratton and Jones (2010) proposed that post-positivism focuses on disproving a hypothesis rather than proving a hypothesis. Furthermore, post-positivism argues that multiple theories can be investigated using both qualitative and quantitative approaches (Gratton and Jones, 2010). Contrary to the abovementioned approaches, interpretivism uses an inductive discourse to explain phenomena occurring in social

life (Edwards and Skinner, 2009). Research sought to analyse the effects of climate change on vulnerable community of Mucheke, Masvingo, thus an interpretivism approach was employed**.**

3.2 Research Approach

The engagement in the research involved qualitative research approaches. Qualitative methodologies are employed for the exploration of phenomena within their natural environment (Creswell, 2012). They encompass the systematic gathering of non-quantitative data through open-ended and conversational means to comprehend, investigate, or delineate the meanings, experiences, and perspectives of research participants. The utilization of qualitative research methods in the study was prompted by its efficacy in theory development, program evaluation, and intervention design. Various tools for data collection in qualitative research exist, including structured, semi-structured, or unstructured interviews, focus groups, observation, and content analysis. In this study, semi-structured in-depth interviews were conducted and are elaborated upon later in this section (Saunders et al., 2019).

3.3 Population and sampling

3.3.1 Population

According to Burns and Burns (2008), the term population refers to the complete set of all relevant observations to the investigator. The study's target population comprises individuals residing in the Mucheke community to mirror a population akin to that of the study on the impact of climate change on the vulnerable community of Mucheke, Masvingo. Potential respondents encompassed representatives from local governance, businesses, organizations, and community members involved in or impacted by the strategies. Additionally, experts in climate change adaptation, such

as academics and researchers, were included. The involvement of other stakeholders like NGOs and civil society organizations was deemed crucial. Nonetheless, due to time constraints, a representative sample was chosen from the identified population to enhance the study's feasibility.

3.3.2 Sampling

3.3.2.1. Sampling Techniques

To gain valuable insights into the impact of climate change on the vulnerable community of Mucheke, Masvingo, purposive and convenience sampling methods were employed to select participants. The study opted for Purposive sampling due to its suitability for selecting key stakeholders, community members, city council officials, and NGO representatives based on their expertise in climate change vulnerability in Mucheke. Identified respondents were then invited to engage in interviews, pre-prepared questionnaires. Therefore, purposive sampling was deemed appropriate as it facilitated the selection of knowledgeable respondents experienced in the effects of climate change on the vulnerable community of Mucheke. Convenience sampling, also known as grab or opportunity sampling, was utilized to select 28 participants from a population exceeding 200 individuals with direct experiences of climate change vulnerability in Mucheke, Masvingo. This approach complemented purposive sampling in the study.

3.3.2.2 Sample Size

Burns and Burns (2008) elucidate a sample as a representative segment of the populace chosen for examination. The researcher employed purposeful sampling due to the intentional identification and selection of key informants predicated on their unique knowledge and experiences. The sample for this particular study encompassed an inquiry into possible effects of climate change on the

vulnerable community of Mucheke, Masvingo. In terms of participants, the study specifically chose 21 community members residing in ward 9 and 11, who are actively involved in community hub committees either implementing or affected by related strategies, along with 4 officials specializing in climate change vulnerability and adaptation such as EMA, Action Aid, City Council, and a Councilor, resulting in a total sample size of 28. This sample size was established considering data saturation to ensure adequate representation of participants reflecting diverse experiences and perspectives pertinent to the research inquiries.

3.4 Data Collection Procedures

In-depth interviews served as the primary data collection method. The questions were created to answer the research questions and meet the previously described study objectives. They were based on the research objectives and literature review. The study aims to collect perspectives and data on the consequences of climate change on the vulnerable community of Mucheke, Masvingo.

3.5 Research Instruments

The tool utilized for data collection in this study comprised in-depth interviews. Aligned with the research objectives and existing literature, the questions were tailored to address the research inquiries and accomplish the predetermined research aims. The primary goal of the research was to gather insights and data concerning the impact of climate change on the vulnerable community of Mucheke, Masvingo.

3.5.1 Questionnaires

Questionnaires, as defined by Cannel and Khan (2008), are a set of questions provided by the researcher for respondents to answer in one of two ways. Open-ended questionnaires were used to

elicit unconstrained responses from participants, allowing the researcher to gather thorough information. The decision to use open-ended surveys was based on their ability to offer participants with thorough insights and clarify any ambiguities. The delivery of questionnaires to inhabitants acted as a research instrument, allowing respondents to respond at their leisure from the comfort of their own homes. This strategy reduced prejudice by removing the presence of an interviewer, who could unintentionally introduce bias through nonverbal clues. Moreover, this method was cost-effective because it did not require training.

3.5.2 In-depth Interviews

An interview is a structured conversation typically conducted between two individuals, namely the interviewer and the interviewee, wherein questions are posed and answered verbally (Neuman, 2006). In-depth interviews represent a qualitative research technique that involves a dialogue between the researcher (interviewer) and the respondent, who is one of the research participants. The researcher developed an interview guide to ensure adherence to the research questions and the accuracy of the data collected. The research project employed semi-structured interviews to gather information from various entities such as Action Aid, EMA, City Council officials, and a Councilor. These interviews were conducted either face-to-face or recorded for subsequent transcription before data analysis. Following Patton's (2010) recommendations, interviews facilitate in-depth exploration through probing and elaboration on respondents' answers. This method allowed for immediate data collection and ensured the authenticity of responses, enabling the interviewer to seek clarification and delve deeper into vague or misunderstood responses.

3.5.3 Observations

Saunders et al (2019) posit that observation serves as a fundamental qualitative research instrument wherein the researcher discreetly monitors the study participants without their knowledge of being observed. The researcher effectively utilized observation as a means to collect data. Throughout the study, the researcher assumed the role of a student on attachment, enabling them to assess the level of climate change vulnerability and adaptation strategies within the community of Mucheke, Masvingo. The inconspicuous nature of observations facilitated the extraction of authentic data, as participants behaved naturally, allowing the researcher to discern valuable insights.

3.6 Data validity and reliability

In the realm of research, meticulous scrutiny of data validity and reliability is imperative. The concept of validity in both quantitative and qualitative research is subject to variation. Validity encompasses transferability and the applicability of research methods across diverse settings. Lincoln and Guba (2009) expound on the threats to validity in qualitative research, delineating internal and external threats. These factors impact the data gathered, warranting a thorough verification process to ensure that the instruments used align with the research objectives. The centrality of the researcher in the research process necessitates vigilant monitoring of collected data, ensuring confidentiality and sensitivity towards participants' perspectives.

Creswell (2012) contends that qualitative research must steer clear of adopting a positivist agenda, advocating for the demonstration of concurrent, predictive, and convergent criteria to establish internal and external validity. Maintaining the integrity of research instruments and engaging respondents are pivotal in upholding the research's validity. Reliability holds significant weight in qualitative research design, encompassing attributes such as honesty, transparency, credibility, and dependability. The research undertook a dependable approach, delving into the perceived impacts

of climate change on the vulnerable community of Mucheke, Masvingo, Zimbabwe, thereby enriching the understanding of the subject matter.

3.7 Data Analysis and Presentation

Analytical techniques for qualitative data were deployed to scrutinize information gleaned from interviews. Thematic analysis emerged as the chosen method for dissecting qualitative data within the study. Caulfield (2000) defines thematic analysis as an approach that involves a meticulous examination of data to unveil recurring themes, topics, and patterns of significance. This method aids in structuring, interpreting, and deriving insights from unstructured qualitative data, including interviews, open-ended survey responses, and various forms of textual content found in journals, social media, and websites, particularly when dealing with extensive datasets.

3.8 Ethical Considerations

Praveen and Showkart (2017) posit research ethics as the adherence to moral and legal principles within the research domain. Saunders et al. (2019) elaborate on ethics as the appropriateness of researchers' conduct concerning the rights of study subjects or those impacted by the research. The researcher ensured compliance with ethical standards set by the university, obtaining written approval from relevant authorities for the study. All participants were duly informed of the research objectives and required to provide consent for participation. Participant anonymity was maintained with no mention of their names in the research findings.

3.9 Chapter Summary

The chapter delved into the intricacies of research methodology, presenting the study's design and rationale for opting for a qualitative approach. Details on sampling methodology, protocols, sample size, and data collection methods were expounded upon. Additionally, the qualitative data analysis procedures were delineated within the chapter.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents primary and secondary data gathered during the data collection. The researcher will, during the presentation of data as well as the analysis, interpret and analyse the information gathered. The data will be descriptively analysed and presented thematically, through used of diagrams and graphs

4.1 Response rates

4.1.1 Questionnaire response rate and analysis

Table 4. 1:Questionnaire Response Rate

Sent Questionnaires	**Completed**	**Distorted**	**Response rate (%)**
22	***21***	***2***	***95%***

Source: Researcher N=22

The data depicted in the table above presents the response rate of questionnaires that were distributed to different cohorts within the Mucheke general area. Out of a total of 22 questionnaires that were sent out, the researcher managed to collect 21 questionnaires that were fully filled out. The response rate of 95% was computed with respect to the target audience, exceeding the 50% threshold recommended by Bryman (2014). This benchmark is crucial in ensuring the

dependability of results, thereby ensuring a thorough depiction of the importance and scale of the population.

4.1.2 Interview analysis

Table 4.1: Interview response rate

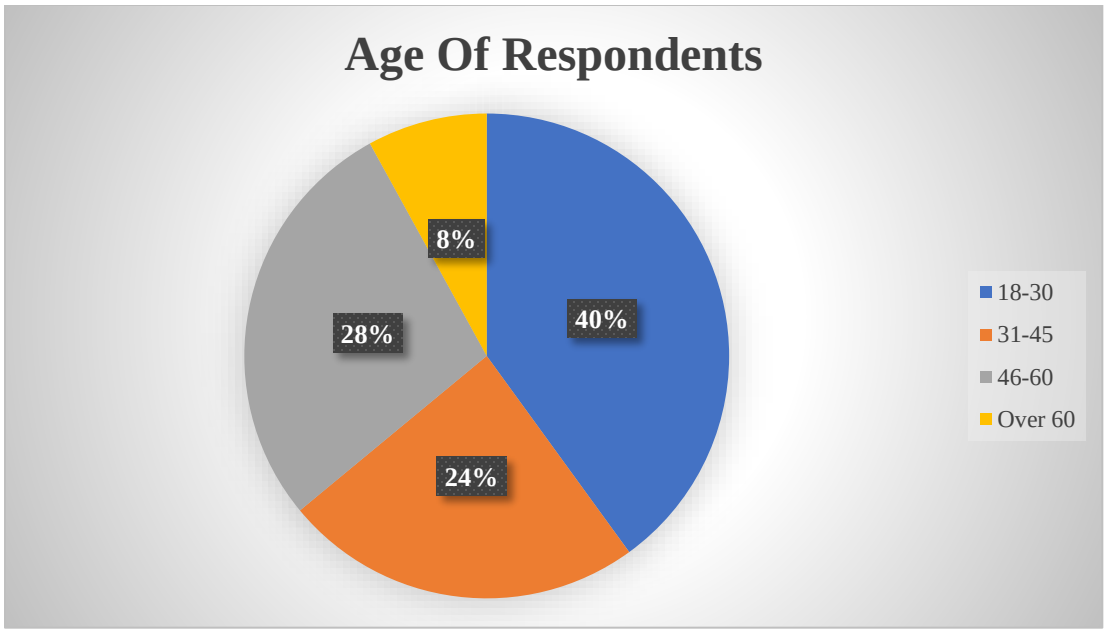
Planned Interviews	*Conducted Interviews*	*Response rate (%)*	*Source: Researcher*
6	***4***	***67***	*N=6*

As depicted in table 2, a comprehensive of 6 interviews were arranged to be executed with experts from affiliated with Action Aid. The principal aim was to accumulate primary data relevant to the research investigation. Among the 6 scheduled interviews, 4 were effectively carried out, resulting in a response rate of 67% and furnishing detailed data.

4.2 Demographic Presentation

4.2.1 Age

Figure 4. 1: Age group response rate

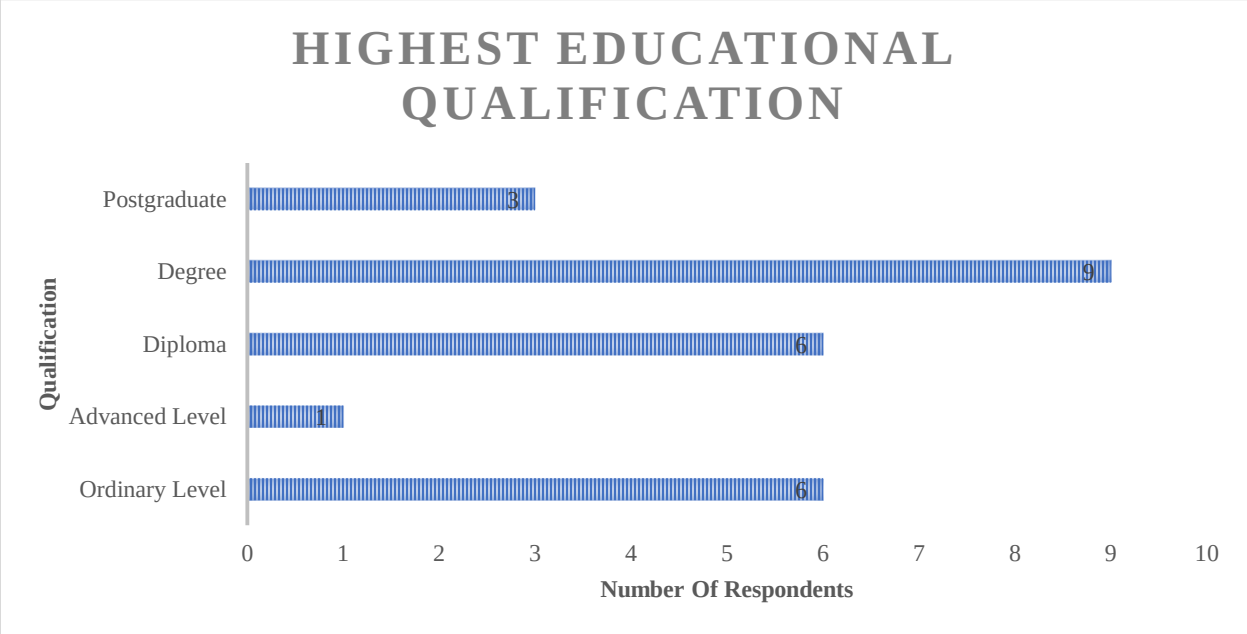


Source: Researcher

The above sample involved four age groups: 18-30 years, 31-45 years, 46-60 years, and above 60 years. The first two age groups represented the younger segment of the labour force, whilst the subsequent categories, particularly 46+ years, referred to the elderly population or persons in the higher age group beyond young adulthood. The majority of the poll respondents, ten in total, were between the ages of 18 and 30. This age cohort had a response rate of 40%. The researcher was able to comprehend the participants' perspectives on the impact of climate change on communities by categorizing them based on their age, which is an important insight that will be examined later. The study focused mostly on those aged 31 to 45. The researcher discovered that this young to middle-aged generation is more open to climate change issues than older groups and is more likely to participate in the adoption phase of measures.

4.2.2 Level of education

Figure 4. 2: Respondents' level of education



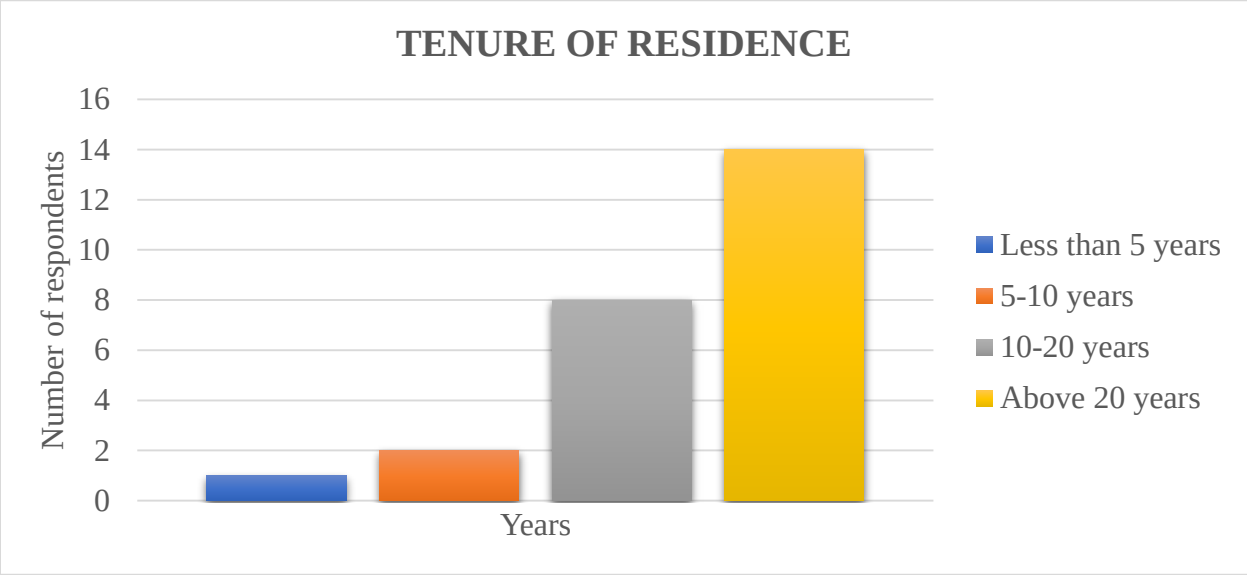
Source: Researcher

The categorisation of the education level was divided into five distinct groupings: ordinary level certification, advanced level certification, diploma, degree and postgraduate, where participants were instructed to indicate their highest obtained educational qualifications. The predominant proportion of participants i.e. 9 respondents possess undergraduate degrees as their highest educational level, with an average of 36%. In contrast, the smallest percentage of respondents, accounting for 4%, representing one individual who held an Advanced level certificate as their utmost educational achievement. Additionally, 6 of the surveyed individuals have acquired a diploma as their highest credential. The remaining 6 respondents representing 24% of participants have an Ordinary level certificate as their highest qualification. From the researcher's viewpoint, these credentials are deemed as the essential academic benchmarks needed to guarantee the collection of reliable and trustworthy data relevant to the research. Moreover, the results indicate

that individuals who have obtained undergraduate and postgraduate degrees exhibit a greater understanding of climate change compared to other cohorts, thereby reinforcing the credibility of the study since these groups constitute the majority of the survey participants.

4.2.3 Tenure of residence

Figure 4. 3: Respondents tenure of residence



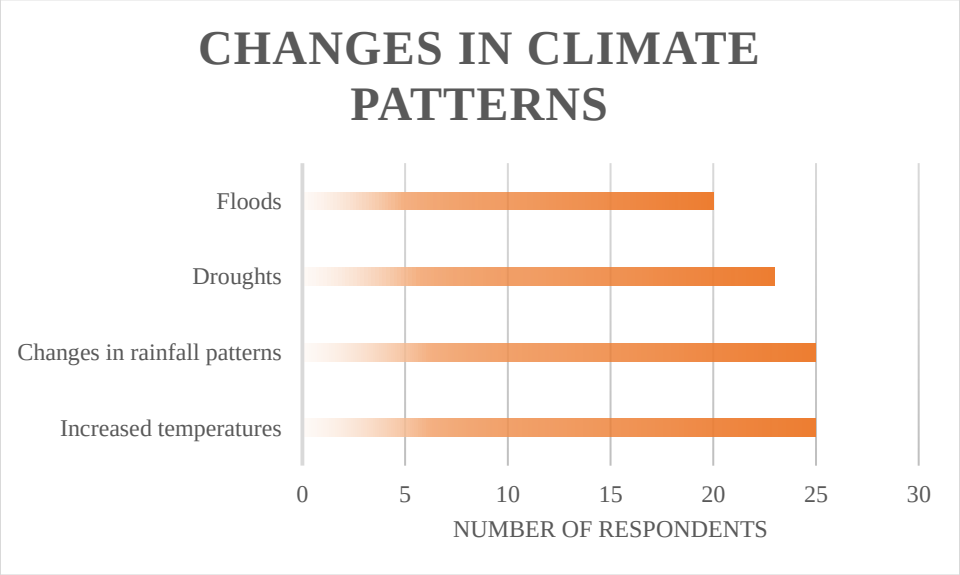
Source: Researcher

The periods of tenancy were grouped into four clusters namely less than 5 years; 5 to 10years; 10 to 20years and above 20 years. Partakers were requested to highlight the cluster that indicated the number of years they had resided in Mucheke. Results disclosed that one individual had less than 5 years of residency in Mucheke, 2 of the participants had stayed in Mucheke for 5-10 years, while 8 had 10-20 years of residence. Furthermore, 14 respondents had lived in Mucheke for at least 20 years. The prevalence of respondents with above 20 years of residence in Mucheke suggested that

the majority of 14 respondents representing 56% of those taking part in this study had more experience with the effects of climate change in Mucheke. Hence, the credibility of the data collected was enhanced.

4.3 Climate change adaption strategies

Figure 4. 4 Climate pattern changes



Source: Researcher

Findings revealed that there has been a discernible change in climate patterns for the residents of Mucheke. The findings are in step with Chapungu and Nhamo (2016), who spoke to the noticeable change in temperature and rainfall evidencing the prevalence of climate change. Residents have experienced increased temperatures, droughts and changes in rainfall patterns. 25 of the respondent's report experiencing increased temperatures, another 25 experienced changes in

rainfall patterns and 23 suggested they experienced droughts. Flash flooding was purported to be experienced by 20 respondents Interviews further revealed that rapid urbanisation has led to increased energy consumption and waste generation, which contribute to greenhouse gas emissions. Further, interviewees pointed out that reliance on fossil fuels and petroleum products for energy production also cause damage, leading to significant carbon emissions. It was pointed out that the frequent power cuts by ZESA led to the use of firewood for cooking and heating contributing to deforestation and air pollution in turn adding to global warming and consequently effects such as increased temperatures.

4.3.2 Adaption strategies

Figure 4. 5 Adaption strategies

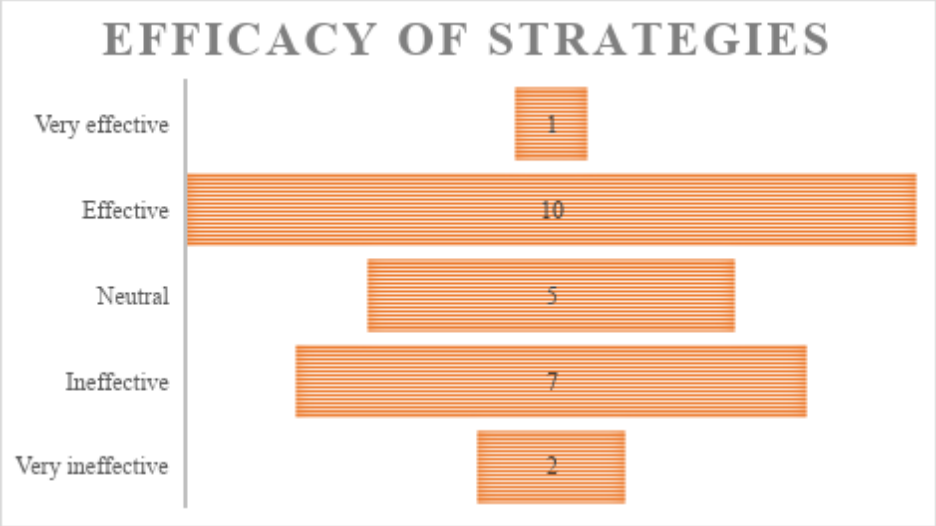
Source: Researcher

In response to the climate changes suggested to have been experienced in Mucheke, respondents outlined strategies that had been put in place for adaptation. Results suggest that residence to the tune of 25 respondents are resorting to irrigation as a possible adaption strategy as was found by Dungy (2022) in a study of Masvingo. 25 respondents are adopting renewable energy such as solar panels to avoid reliance on fossil fuels. To alleviate water scarcity and reduce the burden on municipal water systems 25 of the respondents suggested that collecting and storing water for later use continues to be a common phenomenon, interviews stated that these methods are essential in ensuring that water resources are used efficiently and are available during dry spells. A total of 24 participants suggest conducting educational campaigns, and 23 suggest crop diversification to

adapt to the changes. Urban forestry was highlighted by 19 respondents and 16 cases highlighted relocation as a last resort. Interview respondent submitted that to mitigate flash flooding in Mucheke there had been improved drainage systems allowing for the quick seepage of water aligning with the findings of Madzudzo (2017) on institutional mechanisms. A further 20 respondents showed that urban forestry had been another strategy in the employ of Mucheke residents. Interviews shed more light as respondents cemented the notion of urban reafforestation commending the work done by the annually recognised day for tree planting. Interviews further reported switches to drought-resistant crops and diversifying the types of crops grown. This diversification aims to mitigate the effects of erratic rainfall and prolonged droughts, which are becoming increasingly common in the region as attested by a study conducted by Mendelsohn et al (2020). Furthermore, interviews availed the importance of community and social networks suggesting that local organisations play a significant role in facilitating information sharing and resource pooling. Such cooperative efforts enhance the community's ability to cope with climate impacts collectively. Improved waste management was highlighted as a possible intervention and however it is facing significant challenges for instance, local authorities have admitted significant incapacitation to deal with refuse collection. The vacuum had led to the rampant mushrooming of illegal dumping sites and the enforcement are punitive in dealing with unregulated dumpsites.

4.4 Efficacy of adaption strategies

Figure 4. 6 Efficacy of adaption strategies

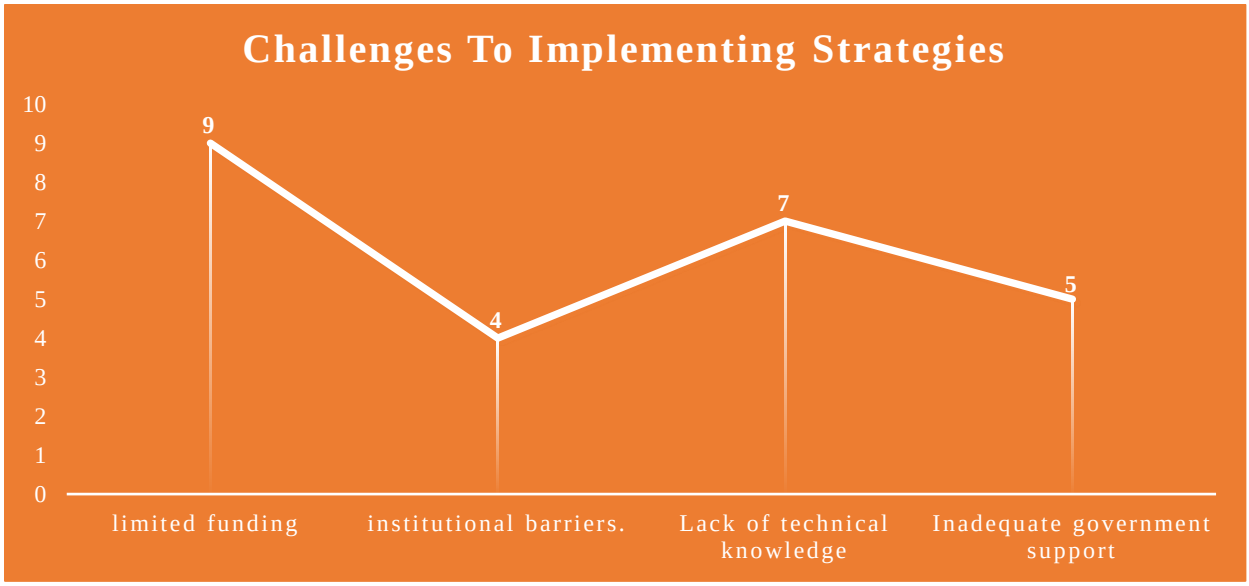


Source: Researcher

Employing a Likert scale derivative, research participants were of the notion that said adaption strategies, are overall effective 10 participant supported by another individual who viewed the strategies to be very effective. These findings were consistent with Essman (2022) suggesting that initiatives being implemented in Zimbabwe are showing some positive results. A total of 5 respondents were neutral to the notion, 7 suggest that climate change strategies are ineffective at best and lastly 2 found them to be very ineffective. The results suggested a consistency with Elliot et al., (2011) who posited that strategies have varying efficacy rates in community resilience. Interviews supported the efficacy purporting that improved agricultural practices have resulted in cheaper sustenance for families, reducing their economic vulnerability. Additionally, it was reported that social resilience was also enhanced through stronger community networks and cooperative efforts. These social structures made it easier for communities to support each other during crises, thereby enhancing overall resilience.

4.5 Challenges in the implementation of strategies

Figure 4. 7 Challenges in the implementation of strategies

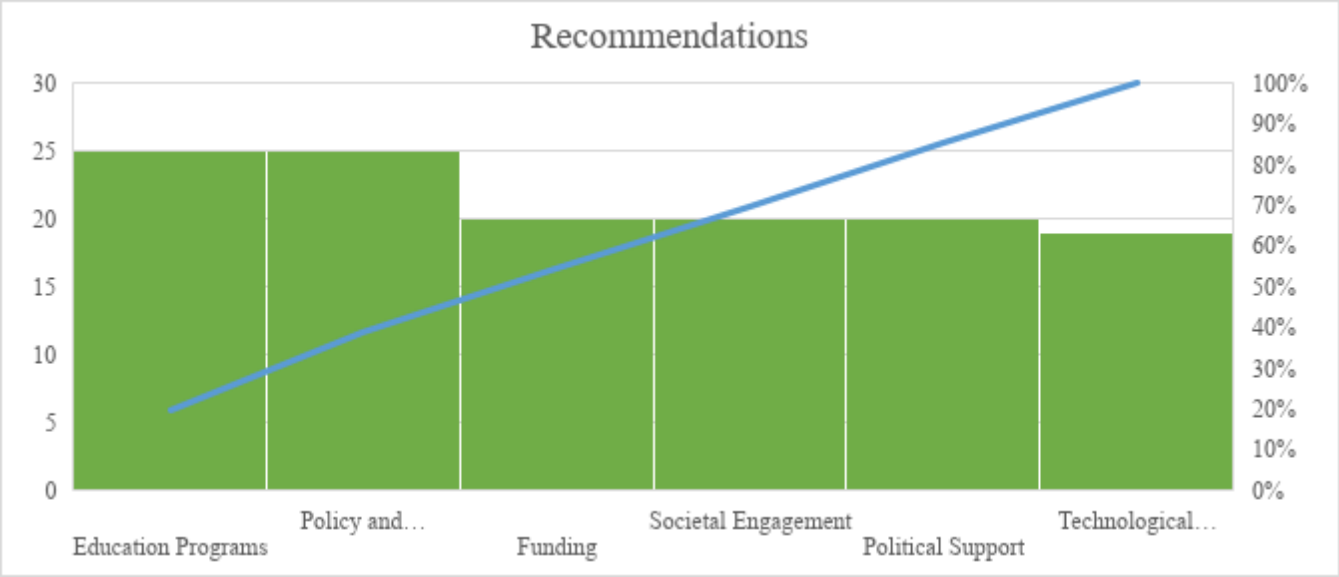


Source: Researcher

Participants responses affirming the existence of challenges in implementing climate change strategies aligns with the inference of Klein et al., (2021) who suggests that there are impediments of trying to implement these strategies to scale. Interviews showed that knowledge and training gaps were prominent hurdles. Participants discussed the need for more training and education on advanced agricultural techniques and climate resilience practices. Without adequate knowledge, the effectiveness of adaptation strategies remained limited. Another recurrent theme was the significant barrier under resource constraints. Participants mentioned financial limitations as a critical issue, preventing the widespread access to modern farming tools and technologies hindering the full potential of adaptation efforts. In support of Muzawazi et al. (2017) and Munhuweyi (2017) respondents further acknowledged that there were socio-economic challenges that hindered adaption strategies

4.6 Recommendations for the reduction of effects of climate change

Figure 4. 8 Recommendations for the reduction of effects of climate change



Source: Researcher

A majority of 25 (90%) respondents recommended that residents of Mucheke undergo educational training on the cause and effects of climate change to reduce the effects of climate change and for the strategies proffered to take root. 20 respondents suggested the need for more funding to reduce vulnerabilities. A further 20 recommended societal engagement on the formulation of strategies. 20 of the respondents suggested the need for robust political support and 25 advocated for policy improvement. The other 19 called for technological advancement. Interview participants called for more financial support from government and non-governmental organisations to fund adaptation projects and subsidies for the acquisition of modern farming tools and technologies

were also suggested. Education and training programs were another recurrent recommendation. There was a strong emphasis on the need for ongoing education and training programs to equip community members with the necessary skills and knowledge. Organising community workshops and training sessions on climate resilience practices was recommended as an effective strategy. Policy and institutional strengthening was also highlighted. Participants suggested the development of robust government policies that support climate adaptation efforts. Simplifying bureaucratic processes to make it easier for communities to access necessary resources and support was another important recommendation.

4.7 Summary

The study on the effects of climate change on vulnerable communities in Mucheke revealed a range of adaptation strategies, their effectiveness, the challenges faced, and practical recommendations for improvement. While the community has shown resilience through various adaptation strategies, significant barriers remain. Addressing these challenges through enhanced support, education, and robust policies is crucial for building long-term resilience against climate change impacts.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This section sought to provide recommendations useful in exposing the scourge of climate change in Mucheke Masvingo as well as reviewing the usefulness of the different strategies used to mitigate the noted challenge both at policy and household level. These recommendations are informed by the research objectives, the findings obtained, and the literature reviewed. The goal is to propose practical solutions that can be implemented to improve the everyday lives of the people of Mucheke, Masvingo.

5.1 Summary of the study

The study took-out to explore the impact of climate change on the residence of Mucheke in Masvingo, with an equal interest on adaptation strategies taken to combat the very phenomenon. The reasons for this research topic choice was multi-thronged, with the major interest being that while climate change has become topical locally, there has been neglect in exploring its effects on urban life. The other area of interest was obviously exploring how much urbanites appreciate this very phenomenon, particular due to the aforementioned realization. Lastly, Mucheke, being the oldest suburb in the oldest city in the country, very much ravaged by drought over the year, made it an ideal study are.

Using a qualitative research approach, the research sought out to gain insight into the research objectives from data obtained from residents and development experts. The first group involved 21 local residents as respondents after a visit to Masvingo City Council, to assist with

familiarization with the city. Although the Director tasked with assisting the researcher could not avail accurate data for population size and density, the mapping provided was useful in clustering available houses in cohorts that helped with the random sampling of individual households visited, and replacing any household which could not provide required data yet without disrupting the model. Three separate meetings were then organized separately with (i) Action Aid, (ii) City Council Environmental Management Department officer, (iii) local Councillor responsible for ward 9 in Mucheke, (iv) Environmental Management Agency (EMA). Action Aid, is an international organization running various initiatives in Masvingo aimed at curbing social injustice, inequality and poverty, targeting sustainable agriculture, women empowerment, education, healthcare and community development while aim is the national custodian of environmental management. For a period of 5 working days in the field, questionnaires were administered to 21 residents, as well as 4 separate interviews thereby totalling 25 respondents. The return threshold was satisfactory for the researcher.

For analysis, data from the questionnaire was reviewed thematically under different demographic themes, to unearth a deeper understanding of the responses. Themes used included age; level of education and tenure of residence. The rational was to unearth the relationship, trends and patterns, if any, between the demographics themselves and (i) knowledge on climate challenge, (ii) attitude towards climate change, (iii) knowledge of existing mitigation strategies by government and various stakeholders, (iv) interest in the latter.

The search unearthed the following key findings:

- Climate change is a lived reality for Mucheke residence.

There was overwhelming acknowledgement that climate change is real by both residents and engaged authorities, with further confirmation that its effects have been felt gravely, with the

consequences only getting worse by each passing year. Some of the reasons attributed to this included the dual effect of rapid deforestation (for firewood) and the consequential use of wood as a power source; the increase in number of motor vehicle on the roads and communities, as well as the consequential use of fossil fuel thus high rates of greenhouse gas emissions; rapid industrialization and the dumping of harmful chemicals into the atmosphere; rapid urbanization which is reducing green spaces for urban use as well poor and improper waste management.

- Effects of climate change are indeed being felt daily

There was a further overwhelming admission that the effects of climate change are equally a lived reality. The major highlights from this component of the research include: flooding; increased intensity and frequency of extreme weather patterns such as heatwaves, sudden heavy rainfall, prolonged dryness, storms, freezing colds; changes in rainfall patterns, unreliability and unavailability of water both for consumption and agricultural purposes.

- Evidence of effort in promoting climate change awareness and adaptation strategies

Another feature of the findings has been on concerted effort to try to educate and empower communities to be both aware of, and responsible against climate changes. The work done in this regard has been to: encourage use of renewable energy; reforestation and improved waste management through government set dates; water harvesting both for subsistent agricultural activities and home use; improved infrastructure resilience from local city council to handle floods and storms; improved service delivery from city council (water management, sewer reticulation, waste management); protecting the ecosystem; promoting sustainable agriculture; improved urban planning by authorities.

- Efficacy of adaptation strategies remains the elephant in the room.

Unfortunately, even in light of improved knowledge on climate change, and the adaptation strategies promoted by both government and its development partners, outside agriculture related interventions, other have either flat-out failed to materialize, or have hit the proverbial brick wall or been ignored by the locals, owing to difficulties militating against them. For instance, whilst the city council would wish to improve urban planning and waste management, resources constraints limit what they can do. It also further puts into question, political will to deal with such proposed interventions, when budgets do not dovetail with work that needs to be done. Poverty has also affected citizens' ability to move towards renewable energy use. Where citizens struggle to purchase solar energy equipment for instance, any reference to the need to move to electricity powered vehicles may be far-fetched and premature. There is also underwhelming appetite to participate in cleaning and tree planting days, which may be a cultural thing or a consequence of other issues that divide communities.

5.2 Conclusion

In concluding, the first finding of this research was that climate change is indeed a lived reality for the residence of Mucheke Masvingo and how it is a demonstrable fact that this is caused by human behaviour. The anthropogenic influence to this includes burning of fossil fuel, industrial processes, deforestation, and poor waste management among other causes. A strong admission on how human behaviour is contributing to this phenomenon. The significance of such a finding is that it certainly calls for intervention by all interested parties, especially where there is reluctance to depart from the very behaviour perpetuating the phenomenon, even where there are many other factors militating against. This calls for advocacy action to really emphasis the increasing risks; importance of behavioural change both at individual and community level to promote sustainable

lifestyle as well as financed interventions by government. There is certainly little or no hope for the future, if human behaviour continues in the trajectory it currently finds itself in.

Secondly, the research also unearthed that the effects of climate change have slowly become part and parcel of everyday life in Mucheke. A confirmation feedback averaging more than 90% for each of the phenomenon used in the research, as evidence of climate change. These included evidence of flooding; droughts; shifts in local ecosystems as well as changes in rainfall patterns and increased temperatures. This was exposed by both responses from residents who filled in the questionnaires administered to them as well as the interview conducted with experts from EMA, ACTION AID and the Masvingo City Council who are all working flat-out to educate and help eradicate this global phenomenon. The significance of such findings is multi-pronged. Firstly, this indeed exposes climate change as not some abstract phenomenon ravaging the developed world as is mostly the attitude in some spheres, but a reality everywhere in the world. Secondly, this finding legitimizes the entire research objective of exploring the interventions by government and its stakeholders, whose conclusions will come out in the third finding.

Thirdly and lastly, the research also unearthed that some work is being done to mitigate against the phenomenon of climate change. It was indeed the research's objective to expose how effective these interventions have been. On the work being done by central government and its development partners, what clearly comes out is the effort to promote information dissemination particularly around behaviour change. Tragically however, the more practical work that needs to be done has been riddled with significant shortcomings. These are mainly due to: limited resources (for such efforts as improved waste management; moving towards clean power sources; improved urban

planning); lack of coordination of the work itself as well as insufficient community engagement for input and feedback. The implication of such realities is that strategies being employed remain abstract and ineffective, so long as they are not modelled in light of the three aforementioned limitations.

Tragically, there is a mismatch between what government promotes, and the ability of residents to adapt. Governance realities are also themselves riddled in contradictions. For illustration purposes, where government (local or central) encourage improved waste management or ending deforestation, proper waste reticulation and availability of ZESA respectively, are both a challenge. Residents are then forced to revert back to the old harmful practices. The same applies for many other proposed interventions. In fact, any intervention that pays a blind eye to inequities and social vulnerability aspects is ill-informed and bound to fail dismally. Development partners have also not given urban agriculture in Mucheke, the attention it deserves, yet it has become a feature of everyday life in urban and peri-urban communities, at different levels. Where interventions are there, they are hampered greatly by significant challenges. Overall, effective adaption indeed requires a multifaceted approach, therefore making it imperative for government, development partners, and the community to deal with such issues as access to information; financial support; education; and strong institutional frameworks to enhance community and household resilience in line with targeted interventions and support mechanism for immediate and long-term needs.

5.3 Recommendations

5.3.1 Addressing Climate Change: A Call for Community Engagement and Integrated Adaptation Strategies

To effectively address the devastating impacts of climate change, policymakers must adopt a holistic approach that prioritizes community engagement and integrated adaptation strategies. The traditional top-down approach, characterized by centralized decision-making and information sharing, has proven inadequate. Instead, community engagement should form the foundation of all development efforts.

5.3.2Community Engagement: The Key to Successful Adaptation

Community engagement is critical in addressing climate change. By involving citizens in the decision-making process, policymakers can ensure that adaptation strategies address the unique needs and concerns of local communities. This approach encourages ownership and participation, fostering a sense of responsibility among community members. In contrast, top-down initiatives, such as randomly declared tree-planting days, often fail to resonate with local populations.

5.3.3 Integrated Adaptation Strategies: Breaking Down Sectoral Silos

Adaptation strategies must also be integrated across different sectors. Climate change affects various aspects of society, from water resources and human settlement to infrastructure management, health, and agriculture. Policymakers should promote intersectoral collaboration, ensuring that departments and stakeholders work together to develop and implement resilience-building initiatives. This integrated approach recognizes that no single sector operates in isolation and that interconnected resilience is essential.

5.3.4 Interconnected Resilience: Matching Resources with Action

Effective adaptation requires more than just information sharing; it demands matching resources and capacity development with intervention efforts. Policymakers must ensure that adaptation

actions are country-driven, gender-responsive, participatory, and transparent. Technical guidance and support from relevant organizations can facilitate this process.

5.4 Conclusion

In conclusion, addressing climate change requires a fundamental shift in approach. Community engagement and integrated adaptation strategies are essential for building resilience and promoting sustainable development. By prioritizing these principles, policymakers can create effective, inclusive, and sustainable solutions that benefit both local communities and the global environment.

References

Birmingham, P., & Wilkinson, D. (2003). Using research instruments. In *Routledge eBooks*. https://doi.org/10.4324/9780203422991

Bryman, A. (2014). June 1989 and Beyond: Julia Brannen's Contribution to Mixed Methods Research. International Journal of Social Research Methodology, 17, 121-131.

Burns, R.B. and Burns, R.A. (2008) Business research methods and statistics using SPSS. Sage, Los Angeles.

Caulfield, J. (2019). How to do thematic analysis. Scribbr. Retrieved from https://www.scribbr.com/methodology/thematic-analysis/

Chapungu, L. & Nhamo, L., (2016), 'An assessment of the impact of climate change on plant species richness through an analysis of the normalized difference water index (NDWI) in

Mutirikwi Sub-catchment, Zimbabwe', *South African Journal of Geomatics* 5(2), 244–268.

Chikodzi, D. & Murwendo, T. & Simba, F. (2014). Climate Change and Variability in Southeast Zimbabwe: Scenarios and Societal Opportunities. American Journal of Climate Change. 2. 36-46. 10.4236/ajcc.2013.23A004.

Creswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.). Boston, MA: Pearson.

Denchak, M., & Turrentine, J. (2021). https://www.nrdc.org/stories/global-climate-change-what-you-need-know

Dinar, A. & Mendelsohn, R. & Williams, L. (2006). Mendelsohn R, Dinar A, Williams L. The distributional impact of climate change on rich and poor countries. Environment and Development Economics. Environment and Development Economics. 11. 159-178. 10.1017/S1355770X05002755

Dungy, C. T. (2018). Is All Writing Environmental Writing? *The Georgia Review*, *72*(3), 674–680. https://www.jstor.org/stable/26574967

Ebi, K. L., Teigen, L. M., & Kirsch, T. D. (2018). Climate change and waterborne diseases. Journal of Water and Health, 16(4), 541-552.

Elliot, M., A. Armstrong, J. Lobuglio, and J. Bartram. 2011. Technologies for climate change adaptation: the water sector.

Environmental Change, 16, 282-292. http://dx.doi.org/10.1016/j.gloenvcha.2006.03.008

Essman, T. (2023, June 27). *Tyler Essman, author at Adapting to Climate Change*. Adapting to Climate Change. https://adaptingtoclimatechange.com/author/t-essman/

Global climate change: what you need to know. Available: website. Accessed 12th May 2024.

Gratton, C., & Jones, I. (2010). Research

Horton, S., Rosenzweig, C., & Wheeler, T. (2010). Climate change and agriculture: Impacts, vulnerabilities, and adaptation. Journal of Agricultural Economics, 61(2), 267-286.

Intergovernmental Panel on Climate Change (IPCC) (2013). Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Khan, M. A., Weber, D. J., 2008. Ecophysiology of high salinity tolerant plants. In: Khan, M. A.; Weber, D. J., Tasks for Vegetation Science vol 40, Springer

Lincoln, Y & Guba, E. (1985). Naturalistic Inquiry Sage.

Mahato, A. (2014) Climate Change and Its Impact on Agriculture in Vietnam. International Journal of Scientific and Research Publications, 4, 1-11.

Malaysian Agricultural Research and Development Institute (MARDI) (2018). Impact of Climate Change on Rice Production in Malaysia. MARDI Report.

Malaysian Ministry of Health (2020). Climate Change and Waterborne Diseases in Malaysia. Malaysian Ministry of Health Report.

Mbaura, W.M. (2021). Climate Change and the Resilience Cause in Masvingo City Urban Landscape, Zimbabwe. *Advances in 21st Century Human Settlements*.

Methods for Sports Studies. London: Taylor & Francis.

Mudombi-Rusinamhodzi, G., & Rusinamhodzi, L. (2022). Food sovereignty in sub-Saharan Africa: Reality, relevance, and practicality. *Frontiers in Agronomy*, *4*. https://doi.org/10.3389/fagro.2022.957011

Mugugunyeki, M. (2022b, December 18). Mwenezi villagers bear brunt of climate crisis. *The Standard*. Retrieved from https://www.newsday.co.zw

Mukundu, C. K., Chineka, R., & Madzudzo, A. (2017). The framing and reframing of science education, training and research in Zimbabwe. In *Sense Publishers eBooks* (pp. 133–155). https://doi.org/10.1007/978-94-6351-089-9_9

Mushore T., Manatsa D., Pedzisai E., Muzenda-Mudavanhu C., Mushore W., and Kudzotsa I. (2017). Investigating the implications of meteorological indicators of seasonal rainfall performance on maize yield in a rain-fed agricultural system: case study of Mt. Darwin District in Zimbabwe. *Theor. Appl. Climatol.* 129, 1167–1173. doi: 10.1007/s00704-016-1838-2

Muzawazi, H., Terblanché, S., & Madakadze, C. (2017, September 11). Community gardens as a strategy for coping with climate shocks in Bikita District, Masvingo, Zimbabwe. Retrieved from https://www.ajol.info/index.php/sajae/article/view/160891

Neuman, W. L. (2006). Social research methods qualitative and quantitavie approach (6th ed.). Upper Saddle River: Pearson.

Nyathi, D., Ndlovu, J., Mare, A., Dzvimbo, M.A., Ndlovu, M. (2024). Women's Vulnerability and Adaptive Capacity to Climate Change in Agrarian Settings of Zimbabwe. In: Mukhopadhyay, U., Bhattacharya, S., Chouhan, P., Paul, S., Chowdhury, I.R., Chatterjee,

U. (eds) Climate Crisis, Social Responses and Sustainability. Climate Change Management. Springer, Cham. https://doi.org/10.1007/978-3-031-58261-5_23

Patton, M. Q., & Patrizi, P. A. (2010). Strategy as the focus for evaluation. *New Directions for Evaluation*, *2010*(128), 5–28. https://doi.org/10.1002/ev.343

Roskilde: UNEP Risoe Centre, Roskilde, Denmark.

Rusinamhodzi, G., & Kongo, V. (2012). Factors affecting smallholder farmers' responsiveness to climate variability induced hazards in Zimbabwe. African Crop Science Journal. 20. 297 - 301.

S, Kajongwe C and Ebuoma (2022) Indigenous Knowledge and Climate Governance in Southern Africa. Springer Nature Chapter 6: ISBN:978-3-030-99410-5

Saunders, Mark & Lewis, Philip & Thornhill, Adrian & Bristow, Alex. (2019). "Research Methods for Business Students" Chapter 4: Understanding research philosophy and approaches to theory development.

Schmidhuber, J., & Tubiello, F. N. (2007). Global food security under climate change. Proceedings of the National Academy of Sciences, 104(50), 19703-19708.

Showkat, N., & Parveen, H. (2017). Non-Probability and Probability Sampling. e-PG Pathshala.

Skinner, James & Edwards, Allan. (2009). Qualitative Research in Sport Management. 10.4324/9780080942629.

Smit, B. and Wandel, J. (2006) Adaptation, Adaptive Capacity and Vulnerability. Global

State of the Global Climate 2022. (2024, March 4). World Meteorological Organization. https://wmo.int/publication-series/state-of-global-climate-2022

University of Malaysia Sabah (2020). Climate Change and Oil Palm Yields in Malaysia. University of Malaysia Sabah Report.

WHO (2018). Climate Change and Health. World Health Organization.

World Bank Climate Change Knowledge Portal. (n.d.). Retrieved from https://climateknowledgeportal.worldbank.org/country-profiles

Ziervogel, G., & Zermoglio, F. (2009). Climate change scenarios and the development of adaptation strategies in Africa: challenges and opportunities. *Climate Research*, *40*, 133-146.