BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SOCIAL SCIENCES AND HUMANITIES

DEPARTMENT OF SOCIAL WORK



The experiences of the elderly on climate change adaptation strategy. A case of Nyatsato ward 24 of Rushinga Mt Darwin.

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR BACHELOR OF SCIENCE HONORS DEGREE IN SOCIAL WORK

JUNE 2026

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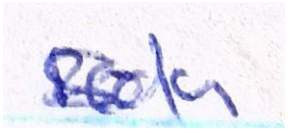
Student's name Rumbidzai Soda Signature  Date 09 / 06/26

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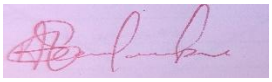
Supervisor Name Mr Sadomba Signature  Date 09/06/26

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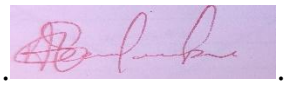
Supervisor signature..... ...Date.09/...06/2026.....

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Dedication

I dedicate this work to my father Shingirai Soda, my mother Martha Onias and beloved brother Benjamin Kabikira whose unwavering support, sacrifices and endless encouragement have been my pillar of strength throughout this academic journey. I also dedicate to elderly men and women of Nyatsato community, whose lived experiences and profound wisdom inspire a commitment to social justice and sustainable future.

List of Acronyms and Abbreviation

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ADI	Appropriate Development Interventions
AFOLU	Agriculture, Forestry, and Other Land Use
AGRITEX	Agricultural Technical and Extension Services (Zimbabwe)
ANZSGM	Australian and New Zealand Society for Geriatric Medicine
BP	Blood Pressure
CEPAW	Centre for Economic Policy Analysis on Welfare
CSA	Climate-Smart Agriculture
CSO	Civil Society Organization
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
DAFF	Department of Agriculture, Fisheries and Forestry (Australia)
DFID	Department for International Development (UK)
EHT	Environmental Health Technician
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion

GCF	Green Climate Fund
HSCT	Harmonized Social Cash Transfer (Zimbabwe)
ICAR	Indian Council of Agricultural Research
IJMA	International Journal of Modern Agriculture
IKS	Indigenous Knowledge Systems
IPCC	Intergovernmental Panel on Climate Change
MOHCC	Ministry of Health and Child Care (Zimbabwe)
NAP	National Adaptation Plan
NDCC	National Disaster Control Centre (India)
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration (US)
NSW	New South Wales (Australia)
PAPE	Russian Academy of Sciences (PAPE acronym used in text)
PMC PLOS	Medicine Collection / PLOS Climate
SLATS	Statewide Landcover and Trees Study (Australia)
SLF	Sustainable Livelihoods Framework
UK	United Kingdom
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification

UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNSW	University of New South Wales
US	United States
WHO	World Health Organization
ZIMSTAT	Zimbabwe National Statistics Agency
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

Abstract

*This qualitative study examined the climate change adaptation experiences of the elderly in the Nyatsato ward 24 of Rushinga, Mt Darwin. Guided by the Sustainable Livelihoods Framework, the literature review spanned developed and developing countries specifically the United Kingdom and Zimbabwe to contextualize global and local disparities. The study addressed three research objectives which include to examine the perceived causes of climate change among the elderly, to explore the specific challenges they face and to develop adaptation strategies to enhance rural resilience. The researcher deployed a qualitative research approach and a case study design, utilizing a purposive sample of 16 participants drawn from both local community leadership and elderly cohorts. Data collection was collected using key informant interviews, focus group discussions, and in-depth interviews with thematic analysis applied for data analysis. Brief findings revealed that the perceived causes of climate change primarily to human activities deforestation, erratic rainfall patterns and neglecting cultural values. These physical risks are further causing challenges like social isolation, age-related health declines, poverty and financial constraints. To cope, key adaptation strategies focus on integrating aging policies, keyhole gardening and growing traditional small grains for enhancing elderly resilience and ensuring sustainable climate responses. It is recommended that policymakers and green social work practitioners introduce climate-smart agricultural inputs and build localized resource centers to fully address the adaptation needs of older adul*ts.

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CHAPTER 1 : INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

Climate change has evolved from a distant environmental concern into a direct threat to the survival of the elderly. Understanding the lived experiences of the elderly in Nyatsato is essential to uncovering the hidden human cost of climate change and the urgent need for age-inclusive adaptation frameworks. Climate change have a crucial impact on the livelihoods of communities making it vital to assess these effects. This study aims to understand the causes, effects of climate change and possible coping mechanisms to address climate change which will help policymakers, governments and organizations understand the extend of the problem and develop strategies to mitigate its effects .This part will outline the structure of the chapter highlighting how climate change is going to be addressed. The background of the study leads ,followed by the statement of the problem highlighting what have prompted the research .Purpose of study and the main research question shows the gist of this research supported by other research questions .The objectives, significance ,delimitations and limitations of the study will be laid out and so definition of key terms and chapter outline. Finally, a summary of the chapter will be laid.

1.2 Background of the Study

Climate change is a natural disaster that occurs at certain periods and significantly affects societies in different parts of the globe including the Rushinga district of Zimbabwe. The Intergovernmental Panel on Climate Change defined climate change as a result of changes in weather patterns such as temperature, precipitation, wind and other components of the earth. Climate system is mainly caused by human actions like burning fossil fuels, deforestation and industries activities. Climate change poses a threat to the livelihood of old individuals all around the world, whereby about 75% of the population is living in rural settings (UNFPA, 2019). In the Lancet Countdown on Health and Climate Change (2023), there has been an increase in deaths by 85% in heat-related cases for individuals aged 65 and above since the 1990s. Research on the climate change adaptation strategies of elderly people is justified due to their vulnerability and marginalization. Therefore, this study seeks to explore the experiences of the elderly people on the climate change adaptation strategies in Nyatsato, Rushinga, especially through perceived causes, challenges, and coping strategies.

Climate change is also adversely affecting the livelihoods of the elderly in the rural settings of developed nations. For example, in the US, it is predicted that heat waves will be responsible for causing 150,000 deaths from heatstroke amongst those over 65 years of age by 2050. In 2021 (NOAA), the US was hit by 22 distinct incidents of weather and climate-related natural disasters which each inflicted damage worth one billion dollars totaling $ 313 billion. The problem of rising seas in the context of sea-level increase in Florida, USA suggests that the levels could rise between 1 and 1.5 feet which means 0.3 to 0.5 meters by 2050, putting two million Floridians at threat of flooding. As per data collected during the 2023 Mediterranean floods, it emerges that the elderly have been disproportionately affected by them, as was the case during Hurricane Katrina, where almost half of those that died were over 75 years old (HelpAge International, 2023). Energy poverty has been estimated to impact 20% of older homes in the UK and other parts of the EU (Eurostat, 2023). Walker and Burningham (2024) contend that the fuel versus food predicament is a slow onset climate victimization process.

Climate change is affecting the livelihoods of rural elderly people in Africa since 75 % of its population depends on agriculture and natural resources. Over 60% of smallholder farmers in sub-Saharan Africa are aged 50 years and above while receiving only 10% of training on climate-smart agriculture (FAO, 2023).According to Justino (2023), when there are droughts leading to crop failures, elderly people become victims of intergenerational sacrifices where they eat very little so that younger household members can eat. It causes quick physical weakening leaving them vulnerable to illnesses that younger and healthier individuals can survive. In South Africa, droughts have led to losses of crop production by 30 %, which affects 60% of the elderly farmers. Heatwaves are killing the elderly at a rate of 80% among those aged 65 years and above (WHO, 2018). In Nigeria, 1.3 million elderly people are homeless due to floods, with 70% of them unable to earn a living. Health problems due to climate change for Ethiopians have risen by 25% amongst the older population, where 40% of them lack access to healthcare facilities. According to the report published by FAO (2023), in sub-Saharan Africa, about 60% of smallholders in agriculture are above 50 years but still receive under 10% of climate change adaptation assistance.

Further on, climate change is affecting the livelihood of rural elderly people in Zimbabwe since 70% of the elderly people who practice agriculture depend on maize farming that has been decreased by 40% due to drought and floods. 60% of the elderly people are facing the

problem of unavailability of clean water since elderly women walk 10km daily to fetch water (UNICEF, 2022). 50% of the elderly population are facing climate-related health challenges such as heat exhaustion and malaria (MOHCC,2020). Chanza and Musakwa (2022) point out that the remittance economy sent by children to their rural parents becomes unreliable owing to climatic changes that affect the whole economy of Zimbabwe. According to Mahiya (2023), the elderly people in Zimbabwe face resource gaps because although they have enough land, they do not have the energy to cultivate the drought-stressed land or money to purchase irrigation machines for farming activities. Consequently, there is a shift from self-reliance to reliance on aids that are humiliating for the elderly. Dube et al. (2024) reveal that the health systems in Zimbabwe are youth-centered since they emphasize maternal and childcare. Therefore, climate sensitive geriatric services are very poorly funded forcing the older people to use indigenous medicine that is gradually vanishing due to climate effects.

In order to combat climate change effects, Zimbabwe resorted to climate smart agriculture with the 26.6 million dollars funding from the Green Climate Fund for climate resilient agriculture. Zimbabwe introduced various tools to combat climate change such as the National Climate Policy of 2017 and the NAP process where they seek to mainstream climate resilient measures into all sectors. According to Mahiya (2023), these frameworks are strong but sometimes fail to have age disaggregated strategies. The most popular tool in Zimbabwe to tackle climate change impacts is the Pfumvudza/Intwasa programme where they have a conservation agriculture approach that is aimed at making small-scale agriculture climate resistant with an emphasis on high yielding farms with small land acreages. The Government has been supplying inputs to those who meet conservation agriculture standards as prepared in advance. Chanza et al. (2024) assert that there has been a participation paradox involving the elderly with this scheme. Due to increased economic vulnerability as a result of the climate change impacts, there has been the introduction of the. Harmonized Social Cash Transfer (HSCT) program aimed at tackling labor constrained and food poor households, many of which are led by the elderly. According to Mubaya and Mafongoya (2023), despite being important, they have faced challenges because of inconsistency in delivery as a result of the inflationary economy. In terms of biodiversity conservation and climate change mitigation efforts, there have been the forest restoration program and the national planting day.

1.3 Statement of the Problem

In Nyatsato communal the effects of climate change pose a crucial threat to the livelihoods of the elderly. This is happening due to changing weather patterns which are increasing frequency of droughts and floods. This demographic relies on agriculture and natural resources for their sustenance faces a lot of problems due to limited mobility, health issues and inadequate access to resources and support systems. According to recent UN and SADC data severe droughts leave over 6 million people in Zimbabwe requiring food assistance during peak learn seasons with agricultural yields dropping by 40 to 50 % during severe drought years. Climate change is being caused by the combination of environmental degradation, extreme weather events and socio-economic vulnerabilities that affect elderly individuals. This is causing food insecurity, loss of income and deteriorating health and well-being exacerbating their marginalization and limiting their ability to adapt to rapidly changing environmental conditions. Hence this research wants to address these challenges which is essential to improve the resilience and adaptive capacity of elderly populations in the face of climate change in Nyatsato communal area in Rushinga district

1.4 Research Aim

This study aims to investigate the experiences of elderly people on climate adaptation strategies in Nyatsato ward 24 of Rushinga, Mt Darwin.

1.5 Research Objectives.

1.To identify the perceived causes of climate change on elderly people in Nyatsato ward 24 of Rushinga, Mt Darwin.

2. To investigate the challenges of climate change faced by the elderly in Nyatsato ward 24 of Rushinga, Mt Darwin.

3. To examine coping strategies that were developed to mitigate the challenges of climate change being faced by the elderly in Nyatsato ward 24 of Rushinga, Mt Darwin.

1.6 Research questions

1. What are the perceived causes of climate change among elderly people in Nyatsato ward 24 of Rushinga, Mt Darwin?

2. What are the challenges caused by climate change among the elderly in Nyatsato ward 24 of Rushinga,Mt Darwin ?

3. What are the most effective coping strategies to prevent the effects of climate change on elderly rural livelihoods in Nyatsato ward 24 of Rushinga, Mt Darwin?

1.7 Significance of the Study

This research on climate change's impact on elderly livelihoods in Nyatsato informed more effective and equitable interventions to protect the elderly population and enhance community resilience. By exploring the causes and effects of climate change, the findings helped to design tailored climate change interventions, support the development of inclusive government policies, and empower the elderly to implement sustainable solutions like renewable energy and manure management. The study also enabled civil society organizations to develop focused programs and allocate resources effectively, while enriching academic literature and serving as a valuable reference for future research and practice.

1.8 Delimitations of the Study

The study focused on addressing the experiences of climate change impact on the livelihoods of the elderly individuals in Nyatsato communal in Rushinga, district Zimbabwe which is characterized by a mix of farming and subsistence lifestyles. The study also focused on providing an in-depth analysis of the context specific challenges and possible solutions applicable to this community. The study was limited not to look at Rushinga as a whole district.

1.9 Limitations of the Study.

The research experienced response bias because the elderly people find it difficult to understand the question due to ageing however the researcher patiently explain the question to the respondents to get enrich data. The other limitation is that elderly participants had health, mobility, or memory challenges that make it difficult to collect detailed and consistent data and however this was addressed by using flexible data collection methods such as shorter interviews, caregiver support, or combining interviews with observation. Another limitation was the potential lack of documented or recorded experiences of older individuals in climate adaptation, which led to gaps in evidence and this was mitigated by incorporating

oral histories with community records and local knowledge sources. The other limitation was that findings was not be easily generalizable across different regions or cultures due to varying environmental and social contexts and this was addressed with the study by clearly defining its scope and encourage comparative studies or include diverse case studies to broaden relevance.

1.10 Definition of Key Terms

Climate change according to Creswell and Pith (2018), refers to a long-term alteration of temperature and weather patterns. These alterations might be natural due to variation in the solar cycle, but ever since the 1800s human activity has been the main cause of climate change due to burning fossil fuels. IPCC (2007) defines climate change as a change in the state of the climate that can be determined by alterations in the mean and the variance of its properties over a prolonged period, usually decades or more. It is defined as alteration in climate over a considerable amount of time caused either by natural variation or by human activities. According to Makungwa, (2010) Climate change refers to a long-term alteration in climate of the earth which might occur due to anthropogenic or natural causes.

Rural livelihoods mean activities, the assets and the access that collectively define the living made by an individual or household (Ellies (1998).

Livelihoods are opportunities that are present in difficult situations according to the Vulnerability Assessment Committee (ZIMVAC, 2005). According to Musekiwa (2013) farm and off-farm activities are categorized as Livelihoods. The definition of Livelihood means methods in which people meet their basic necessities (Scoones ,1998).

1.11 Dissertation Structure

This entire dissertation is divided into five chapters as follows:

This first chapter being the introduction. This chapter provides a background to the study, objectives as well as the scope of the study.

The second chapter covers the related literature in detail for the subject under study, in chronological order. The chapter identifies the Sustainable livelihood framework the lenses in understanding the problem under investigation.

The third chapter is for research methodology employed for the completion of this research. The study is largely informed by the qualitative research methodology in order to exploit the strengths of descriptive data.

Chapter four is mainly data presentation, analysis and interpretation. Here data are provided in thematic analysis under qualitative method to put sense into expressions.

Chapter five is summary, conclusion and recommendation.

1.12 Chapter Summary

This chapter introduced a study exploring the profound, effects of climate change on the livelihoods of the rural elderly population in Nyatsato (Ward 24), Rushinga District, Zimbabwe. Grounded in global, regional, and national data highlighting extreme vulnerabilities such as age-related health risks, agricultural dependency, and exclusion from modern adaptation schemes the research established a critical gap in age-inclusive climate policies. Driven by three core objectives, the study aimed to identify perceived causes, investigate specific challenges, and evaluate local coping strategies through the lived experiences of these older community members. While the scope is strictly delimited to the Nyatsato communal area to provide deep, context-specific insights, the methodology anticipates and addresses practical limitations including participant mobility, memory constraints, and response bias by employing flexible, patient data collection methods. The study seeks to generate vital, localized empirical evidence to assist policymakers, civil society organizations, and academics in designing just, tailored, and age-centered climate adaptation frameworks.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the literature on variables affecting climate change based on several empirical studies. This chapter highlights and discusses the literature on the experience of the aged people in adapting to climate change. The aim of the literature review in this study is to create awareness as to the kind of information available regarding the effects of climate change on the adoption of adaptation strategies to minimize the impact of climate change. Future studies will be helped to identify gaps in the literature and the measures needed to minimize climate change impacts in order to ensure survival in the community. This chapter aims at identifying the theoretical framework that explains the issue under discussion.

2.2 Theoretical Framework

Sustainable livelihoods framework is a theoretical framework applied in this study. The theory is commonly applied in development studies and environmental research in understanding how people use the available assets in order to sustain themselves despite some challenges including climate change. According to the theory, the individuals and households depend on diverse assets which include natural assets, social assets, human assets, financial assets, and physical assets in coping with shocks and stresses. In relation to climate change, the theory offers a way of analyzing how vulnerable groups such as the elderly are able to use livelihood assets in order to create strategies for adapting to environmental changes so as to sustain themselves. The theoretical framework is thus appropriate in analyzing how elderly people in Nyatsato Ward 24 of Rushinga Mt Darwin adapt to climate change challenges in sustaining their livelihood.

2. 3 Sustainable Livelihood Framework

The experiences of elderly people on climate adaptation were analyzed using the sustainable livelihood Framework. The theoretical framework was formulated by Robert Chamber and Gordon Conway in 1992. The framework offers an analytical tool for analyzing the experience of elderly people in Nyatsato ward 24 in relation to the issue of climate adaptation in Rushinga. As indicated above, the SLF indicates that for livelihood to be sustainable, it

must have the capability to cope with stress and shocks and recover from them. The shocks experienced by individuals are mostly climatic and the ability of individuals and households to adapt to climate changes depends on the availability of five major capital assets namely human, social, natural, physical, and financial assets. The theoretical framework is characterized by five core components including livelihoods activities, livelihoods assets, livelihood strategies, livelihood outcomes and livelihood vulnerabilities (DFID, 2000). This theoretical framework operates under the assumption that elderly people live in vulnerability contexts wherein external shocks and trends directly affect the asset base of the elderly people. According to Adato (2002), the sustainable livelihood framework is particularly useful whenever there is a need to analyze rural livelihoods.

The analysis of the subjective reasons why the elderly attribute certain factors to climate change shows the close correlation between their perceptions and interactions with the environment around them. As explained by the theory of Sustainable Livelihoods Framework (SLF), such approaches are not necessarily nonscientific perceptions, as they are the implementation of Human Capital (knowledge accumulated through experience) and Social Capital (memory preserved through institutions) in order to identify structural vulnerabilities in the face of a lack of proper scientific infrastructures. In the research conducted by (Musarandega et al., 2021), which was focused on the application of the SLF, it was mentioned that smallholder populations define their baseline perceptions concerning the environmental processes according to the visible loss of assets in their immediate environments.

The perceived causes of climate change by the elderly are a great concern. Worldwide, in Australia, for instance, the older generation often assesses changes in weather patterns using natural cues such as changes in wind direction, shifting constellations of stars or unusual fruiting in local trees, as opposed to scientific data (FAO, 2020). In this case, the process of tracking weather patterns across a period of fifty years among the older generations is dependent on their cognitive capital in mapping out seasonal change trends (IPCC, 2021).In Africa, in studies carried out in Zambia, there is an observation that while the youth attributes climate variability to industrialization factors only, African elders assess climatic patterns based on the change in behavior of migratory animals as well as unusual peaks in the heat during certain periods of the year (Branlard, 2018). According to Shiferaw et al., (2014), this assessment of indigenous knowledge is considered a vital human asset in ensuring protection

for families at risk in instances where institutional warning does not take place or is inaccessible. Elders in rural Zimbabwe believe that droughts and irregular rainfall patterns occur due to omens or divine wrath in response to erosion of tradition and failure to adhere to local rain-making practices such as rainmaking ceremony (Mavhura, 2020). In semi-arid areas of Zimbabwe, SLF studies indicate that absence of efficient early warning systems prompts the attribution of prolonged droughts, heat waves and frost to divine retribution or an act of God on the part of elders (Ndlovu et al., 2020). In Rushinga, the perception of the elderly is not solely mystic, in addition to divinity, they also observe and comment on the actual human degradation of natural capital. In this regard, it should be noted that they are aware that clearing woodlands and forests in preparation for cultivating crops over the last decades has degraded the local environment. According to Zinyemba et al. (2018), the district of Rushinga is located in Natural Region IV, which features dry weather with considerable temperature fluctuations and where agricultural pests thrive due to increased climate variability during the last years. This phenomenon is observed by the local population in the process of daily monitoring. Finally, according to Ncube et al., (2016), the research based on the SLF indicates that the interaction between aging and vulnerability to climate change produces specific shocks because asset indices among elderly households are low and they are unable to withstand the stress.

Climate change is posing a lot of challenges to the elderly worldwide. In Australia, aged population groups dependent on the land understand climate deviations based on ecosystem collapse, whereby sudden climate change affects soil moisture, destroys water-stressed vegetative covers thus posing survival threats for the vulnerable groups (Enfors & Gordon, 2008). International studies indicate that aging people living in rural areas suffer the most from environmental risks due to their physical and financial vulnerabilities which make them lose property during weather catastrophes (Smith & Petley, 2009). Studies conducted in Angola regarding Livelihood studies review that aging populations gauge the weather based on changes in migratory animals' behavior and seasonable spikes in temperature although they are restricted with physical movement that makes it difficult to develop labor-intensive coping strategies (Branlard, 2018). In terms of national policies regarding climate-proofing such as Pfumvudza/Intwasa, research findings reveal that national frameworks pose a major challenge for elders because of its high demand of human capital that requires digging of plant basins manually that makes it impossible for the old to adapt to zero-tillage or dry planting. Ncube et al. (2016) indicates that livelihood studies at national level indicate that

households having inadequate livelihood capitals such as elderly-headed and women-headed are adversely affected. Mavhura et al. (2015) reveals that local research on the semi-arid border zone indicates that consecutive droughts have led to food shortages and asset depletion in Rushinga's smallholder farmers and the old continue being stuck in a vicious circle of poverty as their assets are depleted to provide their basic needs. Furthermore, instead of merely enduring such problems, elderly people use available assets and innovate resourceful livelihoods strategies that are aimed at achieving desired livelihood goals. According to Musarandega et al. (2021) when apply the SLF approach, once the traditional rain-fed agricultural system collapses, the smallholder farmers need to choose between making on-farm and off-farm adjustments in order to survive despite the risk of environmental harm.

The elderly responded to climate change in positive manner across the globe. Worldwide, for example, in the United Kingdom the SLF indicates that when natural hazards undermine the initial agriculture-based livelihoods, there is need for asset diversification, where the only way to do so is by using social networks or changing to other livelihood strategies (FAO, 2020). Globally, the literature indicates that weather pattern monitoring over an extended period in an ageing population relies much on cognitive capital to track seasonal changes over a period of fifty years (IPCC, 2020.). In Malawi, it is evident from literature that when climatic conditions affect agriculture production, local communities deliberately diversify their sources of income by adopting sustainable livelihoods, such as increased livestock production (Netshisaulu et al., 2025) or temporary coping strategies including selling non-agricultural assets and social networks (Antwi-Agyei et al, 2021). Another upgrade of a physical asset is through the installation of water harvesting and micro-irrigation for ensuring livestock keeping and gardening amid mid-season drought conditions according to Mashizha (2019). According to Rushinga District Council Baseline Report (2022), in Rushinga District, current practices indicate the development of a mixed system of livelihood where elderly people use social capital to engage in institutional solar energy community nutrition gardens and apiculture projects initiated by the government and NGO organizations without having to engage in exhausting farming practices in rain-fed gardens.

2.3 Perceived Causes of Climate Change among the Elderly

Understanding how the elderly perceived the causes of climate change offer valuable insight into how generational lived experiences shape environmental attitudes. The perceived causes

of climate change among the elderly included deforestation and environmental degradation, erratic rainfall patterns and changing seasons and many others reviewed below

2.31. Deforestation

Deforestation is widely perceived by many elderly people as a major cause of Climate Change because they have witnessed the gradual disappearance of forests and natural vegetation over many elderly farmers often associate the cutting down of trees for firewood, farming, and settlement expansion with declining rainfall and rising temperatures (Gutsa,2025). According to FAO (2001) deforestation is the conversion of forest to another land use or the long-term reduction of tree canopy cover below 10%. Globally, studies in Russia showed that rural communities, especially older residents in forest regions, often link environmental change to the loss of forests and increased logging activities (Mokhov,2022). Similarly, in Australia, elderly farmers have associated bushfires and hotter conditions with land clearing and environmental degradation between 2000 and 2017.The Statewide landcover and trees study (SLATS) report released in 2024 showed that 323, 676 hectares of forest and bushland in queen land was degraded or destroyed in 2021 -2022. In Kenya, older farmers in rural areas commonly connected deforestation and population pressure with declining rainfall and soil fertility. The linear infrastructure impact which is a study published in land use policy (2020) found that linear infrastructure roads, power lines and railway lines has caused a 71.5 % reduction in large forest patches in India compared scenarios without such infrastructure. According to the Kenya council of agriculture research (ICAR, 2023) approximately one third of India's territory is affected by land degradation including erosion and water logging. In Zimbabwe, rural communities have reported that extensive cutting of trees for fuelwood and farming has contributed to increased temperatures and reduced rainfall, particularly in semi-arid regions (Ndlovu et al ,2020). The government of Zimbabwe (UNCCD Report) indicated a decrease in forest cover from 53.2 % in 1992 to 41.6 % in 2008 setting 2030 targets for land degradation. Maturise P et al (2023) in his assessment of the factors responsible for the extent of degradation indicates that increasing in curing tobacco energy demands to reduce forest cover then leading to climate change.

2.3 .2. Erratic Rainfall Patterns

Another commonly perceived cause of climate change among elderly people is the disruption of traditional rainfall patterns. According to IPCC erratic rainfall patterns refer to unpredictable variation in timing, intensity and changing seasons are alteration in timing and duration due to climate change. Many elderly individuals remembered predictable planting seasons in the past and therefore interpreted delayed rains, shorter rainy seasons, and sudden heavy storms as signs of climate change. Globally, studies in Russia indicated that older residents have observed unusual seasonal changes such as warmer winters and shifting rainfall patterns, which they associate with environmental instability (Lioubimtseva et al., 2015). The IPCC (2023) reports that human-induced climate change has likely increased the frequency and intensity of heavy precipitation events over most land areas. Seasons that were once distinct are now blurring. In Australia, elderly farmers often described how rainfall has become unpredictable, making farming decisions more difficult. A 2024 study published in science confirmed that rainfall variability has worsened over the past 100 years with Australia being one of the most affected regions Similarly, in India, many older farmers believed that irregular monsoon patterns reflect long-term climate change that disrupts agricultural production (Below et al., 2012). Acheampong et al. (2022) noted that in Zambia, climate change is perceived through the lens of failed expectations. Farmers who used to plant in October now find that the first viable rains may not arrive until December. In Zimbabwe, rural communities have also reported increasing rainfall unpredictability, making it difficult for elderly farmers to plan planting seasons or maintain traditional farming practices (Ndlovu et al ,2020) .The Zimbabwe meteorological services department studies indicated that 30+ years of data indicate rising temperatures about 0.9^{o}C over the last century and declining rain days. Manyeruke et al (2013) discussed the vulnerability of rural communities to changing rainfall patterns focusing on how these shifts undermine livelihood security.

2.3.3. Rising Temperatures

Many elderly people perceived climate change through noticeable increases in heat and extreme weather events such as floods, strong winds, and heat waves. These experiences are often interpreted as evidence that the climate system is becoming unstable (Riederer,2026).

Globally, studies in Russia showed that older residents have reported warmer winters, melting permafrost, and more frequent environmental disturbances, which they view as signs of climate change (Mavhura et al., 2015). The IPCC (2023) confirmed that global surface temperature has increased faster since 1970 than in any other 50-year period over at least the last 2,000 years. In Australia, elderly farmers frequently linked rising temperatures and severe bushfires to changing climate conditions that threatened agriculture and rural livelihoods. Adapt NSW (2024) tracked the 1.44^{o}C increase in temperature since 1910. Bureau of meteorology (2024) confirmed 1.51^{o}C warming from 1910 -2023. Likewise, in India, rural communities often associated climate change with extreme heat waves and floods that affect crops and water resources (IPCC, 2014). Acheampong et al. (2022) noted that in Southern Africa countries like Mozambique, climate change is perceived as a double-edged sword of extremes devastating floods (like Cyclone Idai) followed by scorching heat that evaporates remaining water sources. In Zimbabwe countdown on health and climate change (2024 -2025) tracked the rise in global heat related mortality and highlights 55% rise in death among the elderly due to extreme heat .In Zimbabwe communities have also observed rising temperatures and more frequent heat waves, particularly in drought-prone regions, which negatively affect agricultural productivity and rural livelihoods (Kadungure et al 2023) .Mahiya (2023)finds that elderly Zimbabweans perceived extreme heat as the primary driver of livestock mortality and the withering of crops before they reach maturity. .

2.3.4. Unsustainable Farming Practices

Unsustainable agricultural practices such as overgrazing, continuous cultivation, and poor soil management are also perceived by many elderly people as contributing to climate change. These practices often led to soil erosion and declining land fertility, which elderly farmers interpret as environmental (Mavhura et al., 2015). Globally, studies in Russia showed that communities in agricultural regions often associate land degradation and changing soil conditions with broader environmental change. The IPCC (2023) noted that agriculture, forestry, and other land use (AFOLU) account for about 22% of global emissions. Desyatkin et al (2021) highlighted that the degradation of arable lands in Russia is directly linked to mismanagement, lack of investment in sustainable farming and over grazing which in turn are perceived as factors altering local climates. In Australia, elderly farmers have reported that intensive farming and overuse of land have worsened drought impacts and soil erosion. Dr

Evans et al (2011 -2015) studies indicated that those elderly doing farming are often skeptical of mainstream climate science and instead emphasize that soil degradation and loss of productivity are the drivers of their environment problems. Similarly, in India, Studies showed that 55.9 % of tribal communities in central Indian studies recognized unstainable agricultural practices as the leading cause of climate change (Parry et al ,2007). Acheampong et al. (2022) observed that in Sub-Saharan Africa, population pressure and lack of resources lead to shorter fallow periods and overgrazing. In Zimbabwe, land degradation caused by overcultivation and overgrazing has been associated with declining soil fertility and reduced resilience to climate variability, which particularly affects elderly farmers who rely heavily on subsistence farming (Ndlovu et al ,2020). According to FAO (2020). The Save and Runde basins located in Miombo woodlands suffered high levels of land degradation due to the expansion of agriculture, charcoal production, over grazing, fires and illegal mining which are exacerbated by rapid population growth and climate change. A study by Smith (2018) discovered that unsustainable farming practices greatly increase the risk of drought and water scarcity in many parts of the world.

2.3.5. Cultural, Spiritual Interpretations of Environmental Change

In some communities, elderly people interpreted climate change through cultural or spiritual beliefs shaped by long-standing traditions and indigenous knowledge. Globally, in Russia Verschuuren et al. (2023) argued that for many global indigenous communities, climate change is seen as the Earth reacting to a lack of respect and reciprocity. Environmental change is therefore seen through a holistic, cosmological, and cultural lens where the human environment relationship has been disrupted (Molly H, 2018). In Australia, Aboriginal communities often drew on cultural knowledge to explain environmental change and shifting ecological patterns. The CSIRO and department of climate change e.g. Green et al (2009) showed that aboriginal elders in northern Australia focus on health of ecosystems such as totemic species and water sources as indicators of environmental change. Similarly, in India, some rural communities interpret droughts or floods as spiritual warnings or consequences of neglecting traditional environmental practices (Mavhura et al., 2015). At its core, Indian eco spiritualism is a philosophy of balance where the human and the nature are integral parts of a shared continuum and not in opposition. This vision is pragmatic in a time where disconnection from nature is fueling ecological collapse (Fritz 2025). Acheampong et al. (2022) noted that in Sub-Saharan Africa, climate variability is often perceived as a

withdrawal of blessings due to the abandonment of traditional customs or the desecration of sacred natural sites like groves and mountains. In Zimbabwe, elderly community members sometimes associated climate change with the abandonment of traditional rain-making rituals and cultural practices connected to land and rainfall (Kadungure et al ,2023) . Dr J.P. Nyanza studies indicated that a significant number of people especially the elderly believe climate change is caused by cultural issues including disrespect of traditional shrines and moral decadence. The indigenous based practices of adapting to climate change (2017) by Chirumhanzu detailed that the 55% of households believing in cultural causes such as incest, abortion and ignoring cultural norms are causing climate change. Mubaya and Mafongoya found that elderly Zimbabweans often cite the abandonment of the path and the disregard for sacred days of rest as primary reasons why the ancestors have closed the heavens.

2.3.6. Increase in Population Growth

Another cause of Climate Change that is often perceived by elderly people is the rapid growth of the human population resulting in the expansion of human activities such as urbanization, industrialization, and intensive resource use. Many elderly individuals felt that the environment has changed because there are now more people using land, water, forests, and other natural resources than in the past. Globally, studies in Russia have shown that rural communities often associate environmental degradation and changing climate conditions with increasing settlement expansion and industrial activities (NCLS Research, 2021). The NSW state of the environment report (2021) identified that population growth, densification and associated demand for energy contribute to emissions and local environmental pressure which is recognized as a key driver of change. In Australia, some elderly farmers believed that rapid development, mining, and large-scale farming have contributed to environmental imbalance and rising temperatures. Similarly, in India, older farmers often attributed climate change to population growth and pressure on agricultural land, which leads to deforestation and overuse of natural resources (Maharjan et al (2011-2013). V Acheampong et al. (2022) observe that in Sub-Saharan Africa, population pressure often forces communities to settle in marginal, climate-sensitive areas like floodplains or steep hillsides, which increases the perceived impact of extreme weather. In Zimbabwe, Mavhura et al. (2015) postulated that rural communities have also linked environmental changes to population growth and increased land clearing for agriculture and settlements, which they believe contributes to reduced rainfall and environmental degradation.

2.4 Challenges of Climate Change Among the Elderly

The elderly faced a lot of vulnerabilities to climate change as aging makes them susceptible to harsh weather events. These include high temperatures and heat waves among others reviewed below.

2.4.1 Extreme Heat Waves

Extreme heat wave is a challenge being faced by the elderly due to climate change Climate change has significantly increased global temperatures, which posed serious health risks to elderly populations. Studies showed that older adults are more vulnerable to heat stress because ageing reduces the body's ability to regulate temperature. For example, the 2021 Lancet Countdown report found that heat-related deaths among people aged 65 and above increased by about 68% globally between 2000 and 2019. In countries such as France, the 2003 European heatwave caused more than 14,000 deaths, most of them elderly people (Watts et al., 2021; WHO, 2021). Globally, in Russia older adults bear a disproportionate burden of drought-related morbidity; water scarcity limits their ability to maintain hygiene, which, combined with age-related immune senescence, increases their susceptibility to waterborne pathogens and skin infections (Frontiers, 2026). In Australia a 2024 study of Queenslanders found that older adults are often complement due to the media portrayal of summer as a pleasurable activity and they often fail to change their behavior despite heat wave increasing with the 37% of heat related hospitalizations between 2019 and 2022 occurring in people over 65. The 2023 Lancet countdown in Kenya estimated over 10 000 additional heat related deaths in individuals during 2018 to 2022 compared to 2000 to 2004, with the estimates for 2041 to 2060 indicating even more mortality rates under climate scenarios. Similarly, in Zimbabwe, increasing temperatures in semi-arid districts such as Rushinga have made it difficult for elderly farmers to work in fields during hot periods, affecting their livelihoods and health (Zinyemba et al .2020). The community medicine and public healthcare in their journal (2018) highlighted that the frequency of extreme heat waves has been increasing leading to excess morbidity and mortality.

2.4.2. Drought

One of the major impacts of climate change that can be observed in rural populations worldwide is the phenomenon of drought. Studies showed that drought has a negative influence on agricultural production and threatens food security especially among the elder generation, because of reliance on subsistence farming (Kabelenga,2025) Globally, the aging population is facing a healthcare crisis where heat-related mortality for those over 65 has

risen by 167% since the 1990s primarily due to metabolic and cognitive changes that impair thermoregulation (PMC, 2026). In Australia DAFF indicated that climate driven water scarcity increases pressure on water resources heavily affecting agriculture productivity. Climate change disrupts weather patterns and leads to extreme weather events, unexpected water shortages and water pollution in Russia (UNICEF,2024). For instance, in Ethiopia and Kenya, recurring droughts have reduced crop yields by up to 40% in some rural areas, leaving many elderly farmers unable to sustain their households (FAO, 2020). In Sub-Saharan Africa, the elderly is disproportionately affected by a seven-fold increase in cholera cases in early 2026, as climate-related flooding and drought compromise water sanitation (WHO Africa, 2026). In Zimbabwe, droughts linked to climate variability have become more frequent, particularly in northern regions such as Mashonaland Central Province, where Rushinga is located (Mavhura et al., 2015). These droughts often result in crop failure and water shortages, which severely affect elderly people who depend on rain-fed agriculture for food and income.

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2.4.3 Increased Health Risks

Increased health risk is also a challenge being faced by the elderly due to climate change .The changes in climatic conditions also lead to the emergence and increase in prevalence of climate-sensitive diseases, which impact older individuals more than others (Evengard et al ,2022). Globally, in Russia rising temperatures and changing rainfall patterns create favorable conditions for diseases such as malaria, cholera, and respiratory illnesses (PAPE, 2024). According to the WHO Fact sheet (2023) climate change acts as a trigger for cardiovascular diseases and neoplasms which cause 70% of a human loss in the elderly population. The ANZSGM position statement (2021) showed that respiratory illness is linked from bush fires affecting the aged with preexisting conditions. For example, studies showed that sub-Saharan Africa accounts for over 90% of global malaria cases, with older people facing higher risks due to weakened immune systems (WHO, 2022). In countries such as Mozambique and Tanzania, flooding and heavy rainfall have been associated with outbreaks of cholera and other water-borne diseases (Confalonieri et al., 2000) In rural Zimbabwe, elderly people often faced difficulties accessing healthcare facilities, which increases their vulnerability to climate-related diseases (Maoneke et al ,2023). According to Muzhedzi and Cele (2014)

climate induced erratic rainfall and heat contributed to the spread of waterborne infections such as cholera posing fatal risks to elderly residents in areas with poor infrastructure.

2.4.4. Limited Economic Resources

Socioeconomic factors like limited economic resources is another challenge being faced by the elderly due to climate change. The global population of older adults lacked economic resources which limit investment in coping actions such as irrigation system and improved houses (Ncube,2026). Globally, many older adults live with limited financial resources, which restricted their ability to invest in adaptive measures such as irrigation systems or improved housing, extreme weather and the collapse of traditional livelihoods have forced a mass exodus of young adults from rural areas, resulting in a 30% increase in social isolation for older adults left to manage failing households alone (United Nations, 2024; Romanello et al., 2024). In Russia, Kharuk et al (2021) indicated that the thawing of permafrost destroys infrastructure including houses and utility lines requiring costly repairs that elderly residents on fixed pensions cannot afford. According to the World Bank (2020), nearly 40% of people in sub-Saharan Africa live below the poverty line, which increases vulnerability to climate impacts. CEPAW (2025) showed that in Australia older rural farmers face lower superannuation returns due to drought driven economic volatility limiting their ability to pay for adaptive measures. The PMC (2025) indicated that temperature induced declines in agricultural productivity directly impacts the rural aged people who depend on outdoor labor .The elderly usually physically unable to work harder and see income plunge.in Sub-Saharan Africa, this phenomenon is characterized as constrained adaptation, where migration is not an aspirational choice but a survival mechanism that breaks the intergenerational social contract, stripping the elderly of their primary caregivers and economic supporters (African Futures, 2026; PMC, 2026). Similarly, in Zimbabwe, many older people depended on small-scale farming and remittances from relatives, making them highly vulnerable when climate shocks such as droughts occur (Dube et al ,2024) .The Jambha (2019) showed that the elderly in communal lands e.g. Masvingo rely on subsistence farming .

2.4.5. Migration of Younger People

Another factor influencing climate change impacts on the elderly is the weakening of social support systems. Globally, migration of younger populations to urban areas or other countries

has left many elderly people living alone in rural communities. Globally, older adults with limited physical capacity are 2.7 times more likely to suffer mortality during extreme weather events, as their inability to evacuate quickly or navigate damaged infrastructure leaves them stranded in high-risk zones (ResearchGate, 2025; UN Decade of Healthy Ageing, 2026).The Krasnoshtanova S. (2019) indicated that in Russia young adults leave rural climate stressed places to work in cities leaving elderly parents with minimum support increased anxiety and challenges managing household maintenance in hash conditions. The UNSW (2025) in Australia showed that younger people move to metropolitan areas due to limited job prospects ad drought related agricultural decline leaving elderly individuals in left behind rural areas increasing their vulnerability to extreme heat isolation. The research gate on climate stress migration in India showed that frequent cyclones and sea level rise cause younger family members to leave farming forcing the aged to live alone without caregivers. In Africa, this vulnerability is projected to intensify as heat exposure for older adults is expected to nearly double by mid-century, exacerbating age-related muscle weakness and dizziness (SEI, 2025; WHO, 2026). In Zimbabwe, economic challenges have led many young people to migrate to cities or neighboring countries such as South Africa, leaving elderly relatives behind in rural areas (Jaji et al ,2022). The relief web of the nexus between climate change and migration in Zimbabwe (2022) showed that increased droughts lead young adults to leave for south Africa or Harare leaving elderly parents to manage agriculture alone leading to poverty.

2.4.6. Physical Limitations/ Mobility

Age-related physical limitations also influence how elderly people experience climate change impacts. Research showed that older adults often have reduced mobility, which makes it difficult for them to respond effectively to environmental hazards such as floods, droughts, or extreme heat. The research gate on social wellbeing of elderly people in Russia (2025) indicated that elderly people with reduced income face higher risks during heatwaves because they lack adaptive tools like air conditioning leading to restricted mobility and social isolation. The CEPAW in Australia showed that reduced physical mobility means elderly people struggle to evacuate during fire or flood events increasing their risk of morbidity and mortality due to physical incapacity to cope with sudden environmental hazards. For example, during the 2011 floods in Thailand, a large proportion of affected victims were elderly people who were unable to evacuate quickly. Similarly, studies in Bangladesh have

shown that older individuals face difficulties accessing shelters during cyclones due to limited mobility (HelpAge International, 2018). In rural Zimbabwe, elderly farmers struggled to walk long distances to collect water or cultivate land during drought periods, which increases their vulnerability to climate change impacts (Taruvinga et al, 2023).According to the Ageing , disability and disasters a case of cyclone Idai (2020) indicated that during disasters like cyclone idea in 2019 odder adults faced critical mobility barriers unable to relocate quickly to higher ground due to physical frailty resulting in high vulnerability to injuries and drowning. In Zimbabwe, Moyo et al.(2023)the physical capacity of the elderly is being severely overstretched; as water sources recede due to the 2025–2026 drought, older individuals often suffering from musculoskeletal diseases are forced to travel longer distances over rugged terrain to reach boreholes, leading to a high incidence of falls and spinal trauma.

2.5. Climate Change Adaptation Strategies Among the Elderly

The adaptation strategies for the elderly involve the adoption of measures aimed at ensuring community resilience to changes in weather and climate through addressing their physical and mobility requirements. The following are some of the climate change adaptation strategies currently used by the elderly.

2.5.1. Changing Crop Types

Elderly farmers around the world have increasingly been adopting drought-resistant crops such as small grains and legumes in order to reduce vulnerability to weather fluctuations in the form of unpredictable rains and high temperatures (Mushore et al., 2021). Russian regional climate change adaptation plans (2018) indicated that senior, experienced farmers in Russia adapted to climate change by altering the four-crop rotation system to address heat stress through shifting from wheat production to vegetables. According to Russia's ministry of economic development (2015), climate change adaptation among the elderly involved shifting planting practices through early planting and shifting to crops suitable for climatic zones. The ABARES Research (2023) report highlighted how established farmers adopt strategies of diversifying crop farming into livestock and mixed farming for future sustainability particularly in regions with low rainfall. The ICAR (2023) focused on provision of 109 new crop varieties to farmers, which older farmers adopt in some regions to cope with erratic rainfall. In Sub-Saharan Africa, changes from conventional to drought-resistant varieties is largely made possible by sharing resources between members of age-grade

groups, whereby the elderly are able to share seeds and labor required to practice conservation agriculture (Taylor & Francis, 2025). Smallholder farmers in Zimbabwe, according to Brown et al., (2019), have changed from growing maize to producing drought-resistant crops such as millet and sorghum which has sustained food production for both young and old household members during erratic rainfall periods.

2.5.2. Water Harvesting and Soil/Water Management

Water harvesting and soil moisture management have emerged as foundational climate change adaptation strategies for the global elderly, serving as a bridge between ancient indigenous knowledge and modern survival needs. Globally, these practices are categorized as Nature-Based Solutions where older populations who often lack the capital for mechanized irrigation utilize their deep temporal understanding of local landscapes to implement low-cost, high-impact water retention systems (Rockström, 2002). The Stockholm international water institute noted that in Russia many regions including colder areas traditional water management systems are essential for adapting to flood and drought risks usually managed by establishes local inhabitants. According to the contraptual (2023) rainwater harvesting the Indians introduced the Khadin system a traditional water harvesting method involving the creation of embankments to collect runoff which is still practiced increasing soil moisture. Internationally, communities in semi-arid regions of Africa and Asia use soil and water conservation techniques, such as mulching and water harvesting, to protect soil moisture and crops from climate extreme. In Zimbabwe, the Zimbabwean adaptation fund (2019) indicated that farmers employ mulching and water-harvesting techniques to cope with dry spells and improve soil moisture, strategies that elderly farmers also use often based on sourcing practice to protect their food gardens. Scholars Kademaunga et al (2024) like highlight that elderly farmers in arid regions like Gwanda, Mazowe, and Mudzi are leading a revival of endogenous responses including sand dams, water harvesting pits, and mulching which can extend the time before crop moisture stress sets in by several weeks .

2.5.3. Indigenous Knowledge Coping Practices

Indigenous Knowledge Systems (IKS) and traditional coping practices serve as the foundational framework for climate adaptation among the elderly, acting as a living archive that bridges historical environmental patterns with modern survival needs. Globally, the

IPCC recognized IKS as a major resource for adaptation, emphasizing that traditional knowledge passed down by elders provides nature-based solutions that promote balance between humans and the natural world (UNHCR, 2020) .In Russia , the elder knowledge and sustainable livelihoods in Post-Soviet (2014) showed that elder knowledge in northeast Siberia informs local sustainability definitions and bridges generations to handle environmental changes. The Arctic institute (2021) noted traditional knowledge guides climate change adaptation in Russia's Arctic regions. In India UN Refugee Agency (2020) indigenous communities often guided by elders use traditional knowledge for environmental monitoring and adapting agricultural practices to changing rainfall patterns. Regionally, in Sub-Saharan Africa, these practices are central to community-based responses, where elderly farmers utilize ethno-meteorology predicting seasonal rainfall by observing plant phenology (e.g., the flowering of specific trees) and animal behavior to mitigate the risks of crop failure (Manyanhaire et al , 2022). In Zimbabwe, studies in rural districts showed that communities, including older members, use indigenous knowledge such as seasonal indicators and traditional planting techniques to adjust farming. Agricultural indigenous knowledge systems practiced in Gutu rural district of Zimbabwe (2025) highlighted specific agricultural indigenous knowledge system managed by older farmers for climate change adaptation such as local seed preservation and predictive indicators of weather. The inclusion of IKS into disaster risk reduction (2021) noted that traditional leaders and elders utilize traditional coping mechanisms to manage risks to droughts and disasters.

2.5.4. Diversification of Livelihoods other than Farming

Globally, climate adaptation increasingly involves livelihood diversification for example, engaging in off-farm activities, small trading, or crafts so households are not solely dependent on climate-sensitive agriculture. In Russia, the research gate (2025) particularly in Siberia adapting agriculture to changing climate variability involves shifting to new land use scenarios and in some cases engaging in non-farming activities to sustain livelihoods due to changing agricultural conditions. Internationally, this is seen in countries like India and Bangladesh, where households supplement incomes with non-farm activities to buffer climate shocks. Department of agriculture fisheries and forest (2022) noted that Australian farmers are adapting to lower profits due to climate change by changing management strategies which includes diversifying income sources off farm. In India world bank (2020) supported the diversification of farm livelihoods specifically targeting rural households and integrating non

timber forest produce and livestock to build resilience against climate variability. In Sub-Saharan Africa, diversification is often a response to seasonality of poverty where the elderly engages in small-scale trading, handicrafts, or services to maintain liquidity when crops fail (Sabinet African Journals, 2025). In Zimbabwe, evidence suggested that rural households, including elderly-headed ones, benefit from diversifying income sources e.g, small business activities, labor exchange reducing reliance on rain-fed agriculture and strengthening resilience (Ndlovu,2020). Muringai et al (2022) postulated that elderly rural households are adapting to climate change by diversifying livelihoods increasing labor hours and changing crop types to more resilient varieties although their capacity is constrained by age related labor limitations.

2.5.5 Community Support Network

At a global level, elderly people often rely on social networks and community mechanisms to adapt, such as informal support systems and cooperative farming, which help share labor and resources during stress periods (UNFCCC,2021). Community support networks and collective action served as the social glue for climate adaptation, transforming individual vulnerability into shared resilience through the mobilization of social capital. Globally, scholars defined this collective action as the capacity of a group to pursue shared goals such as flood defense or resource management which is a critical determinant of adaptive capacity (Adger et al , 2003).The Australian community based adaptation to climate change (2009) indicated that community based adaptation is where local action and networking among elderly groups increase adaptive capacity to events like heatwaves. Elderly led communities' groups and traditional networks in rural India are crucial for information sharing on climate risks fostering adaptation in agriculture and promoting sustainable water management (United nations ,2014). In rural Zimbabwean contexts, community groups and extended family networks helped elderly households access labor, share water resources, and coordinate food production efforts, which strengthens overall adaptation capacity even when resources are scarce. Reflections on support mechanisms for older people (2023) explained that in Zimbabwe family and community networks are critical for elderly to deal with hazards, often providing a safety net crisis scenario. scholars like In districts like Bikita and Mutoko, elderly-led adaptation relies on four pillars of social capital collective labor for farming, the Chief's granary for food security village savings and lending and the lending of

livestock to poorer households (PMC, 2021). These networks are not merely coping mechanisms but strategic life-support systems.

2.5.6. Water Storage

Globally, climate adaptation strategies include improving water storage systems through examples like micro-infrastructure to manage variability in rainfall and drought conditions. International projects in semi-arid regions emphasized rainwater harvesting and surface water storage to adapt to changing rainfall patterns, which bolster household water security. According to Petrov A (2020) in Russia noted that rural elderly citizens manage water scarcity by refurbishing traditional wells and using passive rainwater collection to irrigate home gardens. IPCC (2022) highlighted the extensive use of rainwater tanks in Australian households which are used by older demographic to enhance self-sufficiency against water scarcity. Water management organizations ADI interventions (2024) are actively working with farmers in Punjab to convert traditional water bodies into rainwater harvesting structures focusing on creating sustainable water infrastructure at the village level to combat unpredictability. The NDCC ,India (2022) report specifically highlighted the vulnerability of the elderly to heat waves and drought caused by climate change , outlines that adaptation for this place involves improving water security and creating supportive community infrastructure to help them lead self-reliant lives often relying on their traditional water saving knowledge. In Zimbabwe's semi-arid areas, households including elderly farmers used roof water harvesting (Tigere et al ,2018). Mutero J. (2019) indicated that households in Zvimba district in Zimbabwe often led by older farmers engage in water harvesting for livestock and small-scale gardening as a primary strategy to manage drought. The adaptation Fund (2019) national proposal highlighted how rural communities depend on ground water and traditional storage structures to increase resilience to climate change.

2.6 Research gap

There was a clear gap that existed in studies on the experiences of the elderly on climate change adaptation strategies. More studies focused on general communities or economically active groups with limited attention to the specific experiences and vulnerabilities of the elderly (Rhoades,2017). More studies are focusing on

quantitative approaches often overlooking in depth qualitative insights that capture the lived experiences and coping strategies of older individuals (Sandoval,2021). Geographically, Lawrence Ugwu (2023) postulated that researches are relying on developed regions, with relatively few studies conducted in developing or rural areas.

2.7 Summary

This chapter reviewed empirical literature on climate change adaptation among the elderly, framing their experiences through the Sustainable Livelihoods Framework to show how older adults leverage human, social, natural, physical, and financial capitals to navigate environmental vulnerabilities. Globally, regionally, and within the context of Natural Region IV in Rushinga, Zimbabwe, the literature outlined how the elderly perceive climate change through interconnected ecological shifts such as deforestation, erratic rainfall, rising temperatures, and land degradation alongside spiritual and cultural interpretations. These environmental transformations manifested as acute physical, social, and economic challenges, including heat stress, water scarcity, age-selective migration of youth, and exclusive national frameworks like Pfumvudza/Intwasa that demand exhausting physical labor. To survive, the rural elderly mobilizes localized, low-cost adaptation strategies, switching to drought-resistant small grains, reviving Indigenous Knowledge Systems (IKS), diversifying into non-farm livelihoods and utilizing social capital through collective action and traditional water harvesting. The chapter identified a distinct research gap existing that climate literature remains predominantly quantitative, structurally youth-centric, or focused on developed nations, thereby ignoring the qualitative, localized lived experiences of elderly populations in rural, developing contexts.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The methodological chapter discussed the methodology of conducting research including the research design, the population that is to be targeted by the study, and the setting for the study. This chapter also discussed the ethics in relation to the research and some of the difficulties that were faced during the conduct of the research. Finally, this chapter laid a conclusion on what has been discussed.

3.2 Research Philosophy

Research philosophy refers to a set of assumptions regarding reality and knowledge, upon which the researcher bases his/her conduct of research and the interpretation of findings (Saunders, Lewis & Thornhill, 2019). In this research, interpretivism was used in the experiences of the elderly on climate change adaptation since it emphasizes on the meaning of social events or actions from the point of view of individuals (Crotty, 1998). According to Michael Crotty, interpretivism is concerned with the subjective interpretations and experiences of individuals in the analysis of the social reality of the matter at hand (Crotty, 1998). The main purpose of using interpretivism was to give deep insight into the context and perspectives of individuals as opposed to quantitative measures which only measure variables (Crotty, 1998).It was used to explore and interpret participants perceptions and experiences through qualitative methods such as interviews allowing the researcher to understand the meanings participants attach to the experiences of the elderly on climate change adaptation strategies.

3.4 Research Approach

Research approaches constitute general strategy or perspectives used in guiding the process of conducting research in terms of research problems, questions, aims, methodological approach and techniques of data analysis (Bryman, 2015). This study has employed a qualitative research approach for gathering data about the experience of the elderly concerning climate change adaptation strategies. Qualitative research refers to a research approach whose major focus is on the collection and analysis of non-numerical data such as texts, images and observations to give deeper insight into a concept/phenomenon (Creswell,

2014). This type of research approach has been chosen for this study because of its ability to provide detailed understanding of the experience and views of the elderly concerning climate change adaptation. One advantage of the qualitative approach is that it provides room for in-depth data collection. Moreover, it is highly flexible and adaptive, providing for changes to research design and methodology during the research process. Three qualitative methods have been employed for the collection and analyses of data in this study. These are in depth interviews guided by in depth interview guides which gathered perspectives from participants focus groups guided by focus group guides to enrich data and key informant interviews guided by key informant interview guide to gain insights.

3.5 Research Design

Research design is defined as the overall plan and structure of a research study that outlines the methodologies and procedures involved in collecting and analyzing data needed to answer the research question or test the hypothesis raised (Neuman, 2013). This research used the case study research design to investigate the experience of the elderly in adaptation. According to Yin (2017) case study design is defined as an empirical inquiry that seeks to investigate a contemporary phenomenon within its real-life context especially when the boundaries between the phenomenon and its context are clearly evident. In this study, the researcher collected data from a sample of participants through the use of in-depth interviews, focus groups interview guides and key informant interview guide. The choice of this approach was due to the fact that a case study design helps to understand a phenomenon or event deeply and holistically providing a deeper understanding of the complexities and contexts of the case study. It provides opportunity for contextualization of the phenomenon and the event being investigated based on the social, cultural, economic and political contexts in which it occurs. Additionally, it is a flexible approach to studying phenomena. This explained the reason why the researcher found it appropriate to use this type of approach in this research. It greatly facilitated the effectiveness of the research.

3.6 Study Setting

The total population refers to the total number of units that are eligible to participate in a particular study (Siedlecki,2020). Each significant study according to Stratton (2021) define its populations accurately. The study focused on experiences of the elderly in adapting to the

changing weather conditions. It involved the elderly farmers who lived in Nyatsato as the main participants. The secondary participants included extension workers and an EHT. The choice of this population is influenced by Patton (2015) who argues that a researcher needs to focus on the information rich cases which are of value to the study.

3.7 Target Population

The target population refers to the whole group of persons, objects, or events having characteristics and information pertinent to the research being conducted (Burns and Grove ,2005). The target population for the qualitative research on experiences of elderly on climate adaptation strategies was the whole group of persons having characteristics and information pertinent to the experiences of elderly people on climate change adaptation. The primary population for this study was the elderly persons residing in Nyatsato community for not less than ten years. The elderly population comprised of individuals aged 60 years and above who can provide first-hand experiences on elderly livelihood and climate change adaptation in Nyatsato community. Elderly persons are defined as people aged 60 years and above (WHO, 2016). Based on statistical data from the Zimbabwe National Statistics Agency (ZIMSTAT, 2022), the elderly population accounts for 6.4% of the total population of Zimbabwe. In Rushinga District where Nyatsato is found, there are 98,000 elderly persons accounting for 7.2% of the province's population (ZIMSTAT, 2022). The elderly members of the community have extensive experience on impact of climate change on subsistence farming, water availability, public health issues and social security system. The key informants are the individuals who because of their professional roles or positions are knowledgeable on the subject matter under discussion. For instance, in this case study, the key informants were the agricultural extension officers and the EHT responsible for social protection and disaster management.

3.8 Sample Size

Sample refers to a subgroup selected from the entire population in order to conduct the research whereas sample size refers to the number of subjects in the sample used for data collection process (Creswell, 2014). In this current study, the sample included both elderly respondents and key informants knowledgeable about the subject matter. In this research, the sample size was comprised of 14 elderly participants and 2 key informants.

3.9. Sampling

It refers to the act of selecting a small number of individuals from a large group known as a population so that the researcher can conduct research on them in order to make conclusions about the entire population (Saunders et al., 2019). In this study, the researcher made use of the purposive sampling technique. This involved selecting elderly people having experience and knowledge concerning the topic. The researcher used criterion sampling technique in this study to make an intentional selection of the key informants.

3. 9.1 Purposive Sampling

This involves the non-probability sampling technique of selecting participants based on the possession of certain attributes necessary for the study (Patton, 2002). In this study, the purposive sampling was done to purposely select the participants having firsthand experience with the issue under investigation. The importance of using purposive sampling was to enable the researcher to purposely choose those individuals that could provide rich details in the study. Purposive sampling was important in this study because it helped the researcher to get deep insights from informed individuals.

3.9.2 Criterion Sampling

This refers to the purposive sampling method in which the participants are intentionally selected based on their qualifications or certain pre-determined criteria (Patton, 2002). In this study, criterion sampling was used to select the key informants meeting certain criteria like being in the position of a leader, professional, and administrator in connection with the issue of investigation. The importance of criterion sampling is to ensure that only qualified individuals can participate in the study to provide expert insights. It was important in this study because it enabled the researcher to acquire relevant insights from the key informants meeting the required criteria.

3.10 Data Collection Method

These refer to procedures systematically applied by researchers in order to acquire information from participants for answering the research questions (Creswell, 2014). In this study, the researcher used in-depth interviews to explore in-depth personal experiences of the elderly people. Key informant interview technique was used to explore informed and expert

insights from selected agricultural extension officers having specialized knowledge. Focus group discussions were used to collect opinions and views from participants.

3.10.1 In-depth Interview Method

In-depth interviewing is a qualitative research approach whereby in-depth interviews are done with individuals to get rich, deep insights regarding participants' lived experiences and perspectives (Giorgi, 2009). This method was applied in this research whereby six elders' lived experiences and perspectives about the phenomenon under investigation were explored using in-depth interviews. It is important to note that in-depth interviews are important in collecting rich data because they capture participants' experiences, perceptions, and thoughts in details. The researcher used in-depth interview guides while making sure that participants are free to express themselves during the process.

3. 10.2 Key Informant Interview Method

Key informants' interviews are a qualitative data collection methodology involving interviews of chosen experts regarding a research phenomenon (Patton, 2002). This method was employed in this research whereby interviews were done with two government officials, one working at Agritex while the other works at EHT, ministry of health. The value of the method is attributed to the fact that the information collected was reliable, relevant, and rich because it was drawn from knowledgeable individuals. The researcher used key informant interview guides while providing room for elaborations from the key informants on critical aspects concerning the topic.

3.10.3 Focus Group Discussions.

The Focus Group Discussion is a qualitative data collection methodology where a small number of participants engage in group discussions on a research topic guided by an interviewer/facilitator (Krueger,2000). This technique was used in this study to the elderly whereby discussions among groups composed of four participants were done to explore collective perspectives, opinions, and lived experiences of participants. The technique is important in gathering information through group dynamics. Two groups each composed of four participants were used to gather information from FGD using focus group discussion guides to enrich data.

3.11 Data Analysis and Presentation

Data presentation entails the systematic process of organizing data from research in such a way that the emerging patterns or themes become clear and understandable to the reader while data analysis is the systematic process of examination, organizing and interpretation of qualitative data to determine its meaning in relation to research goals (Creswell, 2014). In this study, data obtained from interviews and focus group discussion sessions was analyzed using narrative text presentation method that entails reporting or presenting qualitative data in descriptive form including explanations and quotations from participants' perspectives. Davis (2009) defines data analysis involves a systematic examination, coding and interpretation of qualitative data with the aim of uncovering meanings or patterns. Thematic analysis was therefore used in this study for analysis and interpretation of qualitative data in regard to the experiences of the older people regarding climate adaptation strategy. According to Virginia Braun and Victoria Clarke (2006), thematic analysis entails identifying, analyzing and reporting of recurring themes or patterns in qualitative data in order to enable the researcher to organize his/her findings.

6 Steps of Analyzing Data

Analysis of data entails systematic approach through the following six steps.

Step 1: Data preparation

The researcher Organized collected data into form that enables analysis

Step 2: Familiarization

The researcher Read and reread the collected data in order to have understanding of the content

Step 3: Coding

The researcher Identified keywords, phrases and segments related to the research questions

Step 4: Generating themes

The researcher Grouped codes to generate themes

Step 5: Reviewing themes

The researcher Reviewed themes in relation to all the data collected

Step 6: Interpretation and reporting

3.12 Trustworthiness

The concept of trustworthiness in qualitative research involves the degree of credibility, dependability, and confirming nature of findings in relation to participants' experience (Lincoln, Y.S. & Guba, E.G., 1985). The trustworthiness of this qualitative research was assured through the following four criteria. Credibility- ensured that findings from the research are credible reflections of participants' perspectives Transferability ensured applicability of the findings in other settings Dependability involved verification of the research process Confirmability- confirmed that the research findings are derived from the participants' responses.

3.12.1 Credibility

Credibility is concerned with the level of confidence that can be placed on the truthfulness and accurateness of the results of qualitative research and whether the findings have been based on the real experience of the participants involved (Lincoln, Y.S. & Guba, E.G., 1985). In this current research, credibility has been maintained through triangulation of data sources, member checking, and prolonged engagement.

3.12.2 Dependability

Dependability is concerned with the consistence and reliability of the process used for undertaking research throughout (Lincoln & Guba, 1985). In this study, dependability was upheld through an audit trail of the research process and decision-making process.

3.12.3 Transferability

Transferability involves generalization ability of findings from one situation to another (Lincoln & Guba, 1985). In this study, it was maintained through provision of thick description regarding the participants, their circumstances, and environment of the study.

3.12.4 Confirmability

Confirmability is concerned with objectivity of findings in terms of representing participants' views instead of researcher's bias (Lincoln & Guba, 1985). In this study, confirmability has been maintained through reflexive journaling, reflexivity, and external audits of data interpretation process.

3.13. Ethical considerations

Ethical considerations in research entail principles and practices intended to promote welfare, integrity, and honesty in the research process and respect to the rights of the subjects (Resnik, D.B., 2015). In this study, there were four main ethical considerations including; informed consent, which entailed voluntary participation of the subjects after being fully briefed of the study; confidentiality, which entailed keeping private information of the subjects; anonymity, which means maintaining identity of participants undisclosed in research publications; and finally non-maleficence, which entailed avoiding any physical or psychological harm from participation.

3 .13 .1 Informed consent

Informed consent is one of the most fundamental principles of ethical research defined as a process in which the participant is fully enlightened about the aim, procedures, risks and benefits and other aspects of a study prior to their agreement to volunteer in research (Beauchamp, T.L. & Childress, J.F., 2001). In the current study, informed consent has been attained by presenting the participants with an informative sheet outlining the purpose, procedures, and risks of participation, followed by signing a letter of consent before the start of the study.

3.13 .2 Privacy and Confidentiality

Privacy involves a person's rights to protect personal information and make decisions about what he/she wishes to reveal in the course of participation in a study, whereas confidentiality requires the researcher to keep participants' information away from people who should not be allowed such access (Orb, A., 2001). This aspect of the research has been achieved through participants' selection of settings and degree of information that they wished to share and ensuring that only the researcher had access to the stored information.

3.13.3 Anonymity

Anonymity within research means that participants' identities cannot be identified by the researcher (or anyone else), and therefore their information is not attributed to any particular person (Babbie, E., 2013). This issue was addressed by the use of codes or pseudonyms for all participants and by presenting findings in a way that does not allow identification of particular participants through their statements.

3.13.4 Non maleficence

Non-maleficence is one of the principles of ethical research which means avoiding physical, psychological or social harm to participants in the course of the research (Beauchamp, T.L. & Childress, J.F., 2001). This was achieved through avoiding controversial and potentially sensitive topics within the interviews and focus groups as well as through observation of participants' comfort level throughout the data collection process and allowing participants to withdraw from the study anytime.

3.14 CONCLUSION

This methodology chapter outlined the qualitative framework used to investigate the climate adaptation experiences of the rural elderly in Nyatsato, Rushinga. Rooted in an interpretivist philosophy and a case study design, the research targets an information-rich population consisting of 14 primary participants aged 60 and above with a minimum of 30 years of local residency selected via purposive sampling, alongside 2 key informants an agricultural extension worker and an Environmental Health Technician selected through criterion sampling. Data collection was triangulated using 6 in-depth interviews, 2 focus group discussions, and key informant interviews, all of which were analyzed through thematic analysis across a systematic six-step process and presented in narrative format. The study ensured academic rigor by applying Lincoln and Guba's trustworthiness criteria and strictly adheres to core ethical considerations, protecting vulnerable participants through informed consent, privacy, anonymity, and non-maleficence.

CHAPTER 4: FINDINGS OF THE STUDY

4.1 INTRODUCTION

This chapter presents the researcher's study findings and their interpretation and analysis in relation to study objectives. The research on the experiences of the elderly on climate change adaptation strategies in Nyatsato ward 24 of Rushinga in Zimbabwe has yielded valuable insights were findings were derived through thematic analysis of qualitative data collected via focus group discussions, key informant interviews and in-depth interviews as described in chapter 3. This chapter presents a holistic analysis from the data collected. The findings shed light on the complex perceived causes of climate change, effects of climate change as well as sustainable solutions to overcome climate change.

4.1.1 DEMOGRAPHIC CHARECTERISTICS OF PARTICIPANTS

This section prescribed demographic features of the elderly with the experiences of climate change adaptation strategies in Nyatsato ward 24 of Rushinga Mt Darwin and the key informants who possessed qualities selected from experience criterion. Nevertheless, since the researcher maintained partial anonymity, pseudo names were presented in numbers of the elderly as their counter parts were comprehended by the demographic tabulation. This can be witnessed by two distinct tables presented below.

The Elderly Participants (Table A)

Participant	Gender	Age	Marital status	Educational level	Duration of stay	Village
P 1	Male	65	Married	Primary	34 years	Karombe
P2	Female	70	Widow	Never attended	45 years	Musanzikwa
P3	Female	80	Widow	Never attended	60 years	Wiriyamu
P4	Female	78	Widow	Never attended	50 years	Mhembere
P5	Female	67	Widow	Never attended	38 years	Chirenga
P6	Female	82	Widow	Never attended	62 years	Nyambo
P7	Male	62	Married	Primary	30 years	Tokora
P8	Female	71	Married	Never attended	34 years	Takwana

P9	Female	68	Divorced	Primary	44 years	Madhanzi
P10	Male	64	Divorced	Secondary	45 years	Gonzo
P11	Female	71	Widow	Never attended	42 years	Matimura
P 12	Male	63	Married	Secondary	37 years	Chokuwamba
P13	Female	64	Widow	Primary	31 years	Chinhete
P14	Female	72	Widow	Never attended	43 years	Manongo

The table above showed that primary participants were 60 years and older representing approximately 7.2 % of the provincial population in Rushinga (ZIMSTAT ,2022). The findings showed that as elderly individuals typically reached 60+ years physiologically changes can reduce tolerance to extreme heat and physical stamina. The study found a high proportion of elderly female households and Statistics in Zimbabwe show a higher life expectancy for women. The findings indicated that in Nyatsato older women are frequently tasked with caring for family members during disasters which intensifies their emotional and physical stress (Musasa,2023). The findings indicated that Literacy levels among the elderly is very low which shows that this literacy levels can impact the interpretation of early warning systems and scholars like Zhang (2025) suggested that the elderly possess a reservoir of indispensable knowledge or indigenous knowledge that is vital yet often undervalued community asset for adaptation . The data collected indicated that in Nyatsato income is derived from land and this makes their financial stability sensitive to climate change. Maka et al (2019) argued that over reliance on rainfed subsistence agriculture creates a vulnerability trap for elderly as a single failed season can deplete their entire stock and food supply and this represents a near total absence of financial capital leading to immediate food insecurity.

4.1.2 Key Informants (Table B)

Participant	Gender	Age	Occupation	Education	Duration of stay
K1	Male	60	Agritex officer	Tertiary	40
K2	Female	55	EHT (health worker)	Tertiary	32

The table above showed that the key informants bring deep long-standing local experience to the study. The EHT and the agritex officer holds tertiary education which showed that they brought critical meaningful insights. Campbell et al (2020) articulated that their extensive tenure in the community grants them profound historical context and institutional memory

4.2 The Elderly's Perceptions on the Causes of Climate Change in Nyatsato Ward 24, Rushinga, Mt Darwin

This theme explored various beliefs and understandings held by the elderly regarding their perspectives on the causes of climate change. The sub theme that emerged include deforestation leading to environmental degradation, erratic rainfall pattens resulting in high temperatures, extreme weather conditions resulting in rising temperatures and cultural interpretation of environmental change.

4.2.1 Deforestation

Deforestation emerged as one of the perceived causes of climate change among the elderly in Nyatsato, Rushinga. The participant highlighted that deforestation is a primary driver of severe land degradation triggering a destructive chain reaction for both the environment and local community causing climate change .The participant also highlighted that clearing forests removes the vital canopy and root systems that anchor the soil leaving it completely vulnerable to severe wind and water erosion. This erosion rapidly washes away fertile topsoil, stripping the land of essential nutrients and rendering it unproductive for agriculture. This can be expressed with account of participant who had thus to say.

"The forests where we used to hunt long ago when we were growing up have now become a desert like a cultivated field therefore, the clouds no longer have a place to rest." (P9).

The statement highlighted the drastic consequences of environmental degradation, where the loss of historical hunting grounds that have now become a desert reflects severe ecological decline. This landscape transformation directly impacts local weather patterns, with the poignant metaphor that clouds no longer have a place to rest symbolizing the disruption of the natural hydrological cycle. Another participant has thus to say.

"These days the rains are no longer coming as they used to because people are cutting down too many trees. The land is now dry, and the heat is too much. Long ago there was many trees and the seasons were normal" (P1)

The statement revealed a profound awareness of anthropogenic climate change, where the observation that people are cutting down too many trees directly links deforestation to disrupted weather patterns. This environmental degradation has culminated in severe localized desertification, explicitly stated through the reality that the land is now dry, and the heat is too much. Key informants also expressed that.

"*Right now, the changing of our seasons is being driven by our own hands; the extensive cutting down of trees for fuelwood, tobacco curing, and expanding farms has stripped the land bare, causing the rains to disappear and leaving us to face unprecedented, severe heat*."(K1).

The statement revealed that the harsh reality of localized anthropogenic climate change, noting that the changing of our seasons is being driven by our own hands through extensive deforestation. This aggressive land clearing for farming and tobacco curing has stripped the land bare actively disrupting regional precipitation cycles and causing vital rains to disappear. This underscores a compounding ecological crisis forcing vulnerable agrarian communities to face unprecedented, severe heat due to the loss of their natural canopy.

The findings from the study unpacked from participant's verbatim has exposed that participant directly connects deforestation to a drop in rainfall where the rains are no longer coming because people are cutting down too many trees. This was similar with the study of Duke et al (2021) who established clear thresholds showing that in southern and central Africa high levels of tree cover loss drastically reduces localized rainfall magnitudes directly disrupting rain fed agricultural systems. This showed that they intuitively understand that forests play a vital role in inviting rain and keeping the local atmosphere cool. Globally studies in Russia showed that rural communities, especially older residents in forest regions, often link environmental change to the loss of forests and increased logging activities (Mokhov,2022). The findings from the study also unpacked the environmental decline which shows two major themes that is ecological collapse and agricultural exhaustion. This was also congruent with the study of Silva et al (2020) who argued that a reduction in tree cover fundamentally undermines regional moisture regulation causing the erratic and unpredictable rainfall patterns. Without trees to transpire moisture and create cool canopy zones, localized rainfall patterns are disrupted. Because farmers are repeatedly cultivating the same plots without giving the land time to regenerate, the soil has lost its structural integrity and nutrients. While the blame squarely on local tree cutting Scholars such as IPCC reports argue that the erratic rains and extreme heat in Southern Africa are primarily driven by global greenhouse gas emissions and macro-phenomena like El Niño cycles rather than just local deforestation.

The Sustainable Livelihoods Framework helped in understanding how people survive by managing various assets. Natural capital is the foundation of rural life. Participants shows that this capital is being rapidly depleted. If this trend continues food scarcity can lead to aid dependence and conflicts over the remaining patches of fertile land , households will face a devastating drop in income and the loss of topsoil permanently destroy local biodiversity and trapping the community in a cycle of generational poverty. However, this stark reality can serve as an urgent wake-up call for intervention as this opens the door for NGOs and agricultural extension workers to introduce community-led agroforestry projects. Henceforth it is notably that deforestation plays a vital role as a cause of climate change.

4.2.2 Erratic rainfall

Erratic rainfall also emerged as a cause of climate change among the elderly in Nyatsato, Rushinga. Participants widely agreed that rainfall patterns have become chaotic and unpredictable directly contributing to soaring local temperatures and dried-out landscapes. They expressed deep frustration that the traditional agricultural calendar has completely broken down leaving them unable to predict when to plant. When the rain does finally arrive it often comes in violent, destructive bursts rather than gentle, life-giving showers, failing to nourish the crops and instead accelerating soil erosion. This can be expressed with account of participant who had thus to say.

"The rain of nowadays has no love. It comes beating down terrifyingly, washing away our soil and destroying seeds, and then it disappears for a very long time when the crops are just about to sprout. Long ago, we knew that when November arrived, we would be busy in the fields, but nowadays you can even reach January without a single proper drop of rain." (P11)

The statement revealed a profound disruption in seasonal cycles and weather predictability where the painful reality that the rain of nowadays "has no love" directly captures the erratic shift toward destructive precipitation patterns. This climate instability alters traditional agricultural calendars, turning a historical baseline where "when November arrived, we would be busy in the fields" into an anxious, prolonged drought. The verbatim observation that communities can "reach January without a single proper drop" highlights severe landscape vulnerability and a community coping with a systemic loss of food security over time.

"The rains no longer follow the seasons we knew, sometimes they come too late or stop too soon and we no longer understand the farming calendar" (P3)

The statement revealed a profound disruption in seasonal cycles and agricultural predictability noting that "the rains no longer follow the seasons we knew" due to shifting regional climate patterns. This environmental unpredictability directly destabilizes traditional livelihoods, explicitly captured by the reality that precipitation can come too late or stop too soon" during critical growing phases. The verbatim admission that "we no longer understand

the farming calendar" underscores a severe loss of generational ecological knowledge, leaving vulnerable farmers struggling to adapt to an unstable ecosystem. Another participant has thus to say.

"Rain used to be a visitor people could trust. People knew exactly when to prepare hoes and when to put seeds in the ground. But now the clouds just tease us. They gather and look heavy but disappear. When the rain finally does come, it falls with such violence that it washes away the soil and then it disappears for weeks leaving our small crops to die in the dust. The seasons have lost their way." (K2)

The narrative underscored a profound sense of ecological instability, where the historical memory that "rain used to be a visitor people could trust" establishes a reliable baseline of seasonal predictability. The verbatim observation that violent downpours wash away the soil and leave "small crops to die in the dust" highlights how erratic weather patterns destroy vital natural capital, confirming that the seasons have completely lost their way.

The findings from the study unpacked from participants verbatim has exposed that there is a complete cut off from the predictable rhythms of nature. The participants' unpredictable seasons and mid-season dry spells are congruent with the research by Shumba et al. (2020) who documented that the onset of the rainy season in Southern Africa has significantly shifted forward often delaying until late December or January .This showed that communities used to rely heavily on a reliable calendar to plan their lives knowing exactly when to clear the land, when to plant and when to harvest. This highlighted a profound sense of disorientation and loss and a complete breakdown of ecological predictability. Indigenous knowledge systems allowed farmers to use months like November as a hard marker for planting. Acheampong et al. (2022) noted that in regional African contexts, climate change is perceived through the lens of failed expectations. That generational knowledge is rendered ineffective because rains may not fall until January. Furthermore, the rain has shifted from a gentle visitor to an aggressive force that causes flash floods stripping away topsoil rather than soaking into it. Even if seeds survive the initial violent rains the sudden weeks-long disappearances of rain create a deadly trap for young plants causing them to wilt and die. Research by Seneviratne et al. (2012) confirmed that global climate change is causing rainfall to become more intense meaning it falls in shorter, heavier, and more violent bursts interspersed with longer, harsher mid-season dry spells.

The SLF helped to trace how this unpredictable weather attacks the community's survival assets. Erratic rainfall and sudden mid-season dry spells are powerful environmental shocks because they completely destabilize the local ecosystem. If these erratic rainfall patterns and intense heatwaves persist the constant failure of crops will worsen mental distress, cause severe food shortages and increase malnutrition rates particularly among children and households will fall into a trap of wasted money, as buy seeds that will die. This financial ruin will trigger mass migration, forcing able-bodied individuals to abandon. However, these difficult conditions can create an ideal opportunity for extension officers to introduce Climate-Smart Agriculture and implement community-based early warning systems. Hence one can say that erratic rainfall patterns is a cause of climate change.

4.2.3 Extreme Weather Conditions

Extreme weather conditions also emerged as a perceived causes of climate change among the elderly in Nyatsato, Rushinga. Participants described an unprecedented rise in local temperatures and increasingly harsh weather extremes that have disrupted their daily lives and agricultural routines. According to the participants these extreme thermal conditions have compressed their productive working hours induced heat-related illnesses like dizziness and exhaustion and accelerated the drying up of vital water reserves making both survival and farming a daily struggle. This can be expressed with accounts of participant who had thus to say.

"These days it has become excessively hot, to the extent that most of the time the wind itself is so hot that it ends up killing our crops, which is making our lives very difficult." (P3)

The statement highlighted a severe escalation in temperature extremes and localized environmental stress, noting that "these days it has become excessively hot" due to shifting microclimates. This compounding atmospheric pressure directly threatens the community's primary livelihood, explicitly stated through the reality that "the wind itself is so hot that it ends up killing our crops. The verbatim reflection that this ecosystem collapse is "making our lives very difficult" underscores the profound socio-economic vulnerability of an agrarian community struggling to survive under conditions of acute thermal distress. Another participant has thus to say.

"The sun nowadays is terrifying. The heat feels as if someone is stabbing you in the back with spears of fire. Long ago, we could spend the whole day weeding in the field until sunset, but nowadays, once 10:00 AM arrives, you are forced to leave the field because you feel dizzy and completely drained of energy. The country has become so hot that even water stored in tanks literally boils." (P11)

The text highlighted a terrifying escalation in thermal extremes and physical vulnerability, noting that the intensifying ambient heat "feels as if someone is stabbing you in the back with spears of fire." This compounding atmospheric distress directly undermines agricultural productivity, forcing a drastic shift from historical baselines where community members "could spend the whole day weeding" to a reality where they must abandon their work by 10:00 AM due to dizziness and exhaustion. The verbatim reflection that the country has become so hot that "water stored in tanks literally boils" underscores the profound crisis of climate change, severely disrupting daily survival and human labor capacity. Another participant has thus to say.

"*The sun has changed its character. It no longer just warms the earth, but it bites. Even in the early morning, you can feel the heat piercing through your shirt. The ground has become so hot that if you walk barefoot, your feet feel like they are being cooked in a pot. It was never like this when we were young; the air used to be soft, but now it is angry*." (K1)

The statement revealed a profound shift in thermal intensity and environmental hostility, where the vivid observation that "the sun has changed its character" directly illustrates a community grappling with severe microclimatic shifts. This extreme heat actively disrupts daily routines and physical comfort, explicitly captured through the sensory reality that ambient temperatures no longer warm the earth but instead feel as though "your feet feel like they are being cooked in a pot. This aggressive climate against an ecological baseline where "the air used to be soft" underscores a traumatic loss of environmental stability, forcing community members to endure an increasingly angry and inhospitable landscape.

The findings from the study unpacked from the participant verbatim has exposed that climate change is not an abstract concept to them and this shows that It is a violent physical reality. The environment has become physically hostile to the point where simple daily tasks like walking barefoot or touching stored water have become painful. This is congruent with the

studies by scientists such as Hough-Guldberg et al. (2018) who have documented that Sub-Saharan Africa is warming at a rate twice the global average explaining the participants' shock at the terrifying new heat levels. Globally, studies in Russia showed that older residents have reported warmer winters, melting permafrost, and more frequent environmental disturbances, which they view as signs of climate change (Mavhura et al., 2015). The extreme morning heat now cuts their working day short by 10:00 AM. This is also similar by the Research by Dunne et al. (2013) which proved that environmental heat stress heavily reduces human work capacity. This drastic reduction in labor hours directly reduces how much land they can cultivate and care for. The heat is no longer just a passive backdrop as it acts as an active destructive agent. The wind itself carries enough heat to wither and kill crops directly, independent of actual rainfall shortages.

The Sustainable Livelihoods Framework helped to see how extreme heat dismantles a community's asset base. Unbearable heat waves and scorching winds act as sudden unmanageable environmental shocks that the community cannot control or predict. If these extreme temperatures continue to rise socially, the community will face a spike in heat-related illnesses placing a heavier burden on local healthcare. Economically, agricultural output will crash as humans physically cannot spend enough hours working the fields which lead to food shortages and financial poverty. Environmentally, the extreme surface heat will bake the soil into a hard and kill plants. However, this severe clear pathway for NGOs and local governments to introduce the construction of covered water storage facilities to prevent evaporation. Thus, one can say that extreme heat is a cause of climate change.

4.2.4 Spiritual Cultural Interpretations of Environmental Change

Spiritual cultural interpretations of environmental change also emerged as a perceived cause of climate change. Participants emphasized that environmental degradation and changing weather patterns are deeply tied to a spiritual and cultural breakdown within the community. Elders and traditional leaders interpret the severe droughts, intense heat, and erratic rains as a direct consequence of disrespecting ancestral laws, neglecting traditional rituals and abandoning cultural heritage. They expressed that the land itself possesses a spiritual consciousness that reacts to human behavior hence the departure of sacred water spirits , the

desecration of holy caves and a general decline in moral values among the younger generation have caused the ancestors and God to turn their backs on the community withholding the rain as a form of spiritual discipline. This can be expressed with the accounts of participant who had thus to say.

"The winds and weather have changed because we no longer value sacred things and taboos. Long ago, we had sacred trees that were forbidden to be cut and caves where the ancestors dwelled. Nowadays, the youth just barge in everywhere talking shamelessly. The land is angry, and the rain is ashamed to fall because our culture and way of life have rotted." (P4)

The statement reviewed a profound indigenous attribution of climate change to cultural erosion, where the belief that "the winds and weather have changed because we no longer value sacred things and taboos" links environmental shifts to cosmic and spiritual misalignment. This social transformation creates a generational rift within the community miniature, explicitly captured by the reality that "the youth just barge in everywhere talking shamelessly" and violating historical ecological sanctuaries. The poignant metaphor that "the land is angry and the rain is ashamed to fall" underscores how a perceived decay in traditional customs directly triggers localized drought illustrating a community coping with the severe spiritual and ecological consequences of a lifestyle that has rotted. Another participant has thus to say.

"It used to be that before the first rains fell, we would gather first to thank the ancestors. But today, those traditional courts and gatherings no longer exist. People only care about modern churches now, leaving their ancestors starving. God and the ancestors have turned their backs on us, which is why the sun is piercing us like this." (P12)

The statement revealed a deep-seated indigenous perception that correlates environmental crisis with the abandonment of spiritual customs, noting that "God and the ancestors have turned their backs on us" due to religious and cultural shifts. This structural erosion of social capital directly impacts traditional resource management, explicitly stated through the reality that the sacred courts and gatherings that once regulated communal life "no longer exist" in the wake of modernization. The verbatim reflection that a neglected ancestral realm has left the community to endure a sun that "is piercing us like this" illustrates how a perceived

spiritual disconnect actively explains the onset of severe, localized thermal distress over time. Another participant has thus to say.

"*You have to understand that in Nyatsato, the environment is not just soil and water it is a spiritual heritage. When the elders see the drought, they do not see carbon emissions; they see a breakdown of the soil and moral fabric. They tell me daily that the water spirits have left the dry riverbeds because of the decline in sanctity. While as leaders we encourage modern conservation, we cannot ignore that for the elderly, adaptation starts with restoring their cultural identity and seeking reconciliation with the land through traditional rites."* (k2)

The statement highlighted a profound intersection between environmental management and spiritual heritage, noting that when elders observe severe drought, "they do not see carbon emissions; they see a breakdown of the soil and moral fabric." This indigenous perspective reframes ecological degradation through a cultural lens, explicitly stated through the narrative that "the water spirits have left the dry riverbeds because of the decline in sanctity." The leader's realization that "adaptation starts with restoring their cultural identity" underscores that sustainable environmental resilience cannot rely solely on modern conservation but must actively integrate traditional rites and a restoration of communal sanctity to reconcile with the land.

The findings from the study unpacked from participants verbatim has exposed that cosmological world view nature, humanity and the spiritual realm as completely interconnected. The environment is not passive natural resource property. It is alive, sacred and holds memory. The participants' spiritual interpretations match the research of Chemhuru and Masaka (2010) who argue that Shona taboos historically functioned as highly effective, indigenous environmental conservation methods that protected forests, water sources and wildlife from overexploitation. This show that environmental responses are interpreted as direct communication from the spiritual realm regarding human morality. In Russia Verschuuren et al. (2023) argue that for many global indigenous communities, climate change is seen as the Earth reacting to a lack of respect and reciprocity. The shift toward westernized religious structures is viewed by elders as a form of cultural abandonment that leaves the ancestors starving triggering spiritual abandonment in return. This is in line with the belief that water spirits inhabit and protect water bodies and will leave if the water is desecrated is well-documented by scholars like Mavhura and Mubaya (2023) in Zimbabwean

rural contexts Local communities do not diagnose their problems using global scientific terminology like carbon emissions and environmental disasters are diagnosed as a breakdown of the moral fabric. This shows that Physical changes, like a river drying up, are interpreted as the spiritual consequence of the water spirits fleeing human disrespect and pollution. However, The Secular Scientific Argument Mainstream Western environmental framework IPCC, view climate change purely as a physical, atmospheric, and socio-economic issue driven by industrialization and greenhouse gases.

The SLF assisted the elderly in Nyatsato in indigenous knowledge, taboos and spiritual beliefs form a massive part of their Social and Cultural Capital. Erosion of Social/Cultural Capital represents a collapse of internal social structures and shared rule. If the generational and religious rift deepens, it could lead to social fragmentation as young people and modern churchgoers openly dismiss traditional taboos fracturing the community's social safety nets. The neglect sanctity of local forests or caves and destruction of natural water sources may lead to the failure of development and conservation projects. However, blending modern science with traditional rites and honoring the community's cultural identity creates deep local ownership and inspires the community to actively protect the land they consider holy. Thus, one can say that spiritual interpretation of environmental change is a perceived cause of climate change.

4.4. Challenges of Climate Change Faced by the Elderly in Nyatsato Ward 24, Rushinga, Mt Darwin

This theme explored various beliefs and understandings on the challenges the elderly is facing due to climate change. The sub theme that emerged include water scarcity leading to drought, diseases leading to health risks, limited economic leading to poverty and social isolation due to migration of the young adults.

4.4.1 Water Scarcity

Water scarcity emerged as a challenge being faced by the elderly in Nyatsato due to climate change. Participants described a severe water crisis driven by prolonged droughts which has deeply impacted the daily survival of the community especially the elderly. They highlighted that critical water sources such as local wells, boreholes and the Nyatsato river have either

completely dried up or turned into dusty beds forcing residents to desperately scoop through sand just to find muddy, unsafe water. The participants emphasized that this scarcity places an exhausting physical burden on frail older people who must walk dangerous distances to secure water. This crisis has broken down traditional family support systems creating a hazardous environment where vulnerable elders are forced to skip meals or miss life-saving medications simply because they lack clean water. This can be expressed with accounts of participant who had thus to say.

"Water is troubling us greatly. These legs of mine are no longer strong, but I must walk a terrifyingly long distance to the river because the borehole nearby broke down a long time ago. I arrive back home with my whole body shaking from sheer exhaustion." (P5)

The statement revealed a severe depletion of physical and infrastructural assets, noting that acute water insecurity "is troubling us greatly" due to systemic maintenance failure. This operational breakdown directly compromises the vulnerability and well-being of the elderly, explicitly captured by the reality that an individual must "walk a terrifyingly long distance to the river because the borehole nearby broke down." The verbatim reflection that they return home with their "whole body shaking from sheer exhaustion" underscores the harsh physical toll and erosion of human capital within a community struggling to secure basic survival needs over time. Another participant has thus to say.

"Long ago, the well in my field had cool water all year round. Today, it is left as nothing but a grave of dust. The Nyatsato River used to require us to cross over dry ground in winter, but nowadays you must dig up the sand just to find dirty water for drinking and for the livestock. My heart aches to see us living like aardvarks, constantly digging into the earth searching for life that cannot be found." (P13)

The narrative underscored a severe depletion of natural capital and localized water resources, where the memory that "the well in my field had cool water all year round" serves as a fertile historical baseline. This hydrological decline directly threatens human survival and livestock preservation, explicitly captured through the reality that community members must now "dig up the sand just to find dirty water" along the drying Nyatsato River. Ultimately, the poignant metaphor comparing their survival to "living like aardvarks, constantly digging into the earth" highlights the profound emotional trauma and physical exhaustion experienced by a

community coping with an ecosystem stripped of its vital life source. Another participant has thus to say.

"The drought situation in Nyatsato has reached a critical threshold. We are seeing a massive drop in the water table, which means many of the older shallow boreholes have simply failed. For a 25-year-old, walking 6 km for a bucket of water is a duty; for a 70-year-old grandmother, it is a health risk. We have reports of elderly residents skipping meals or failing to take medication because they simply don't have enough clean water. It's not just an environmental issue anymore; it's now a protection crisis because the traditional safety nets are being stretched beyond their breaking points." (K1)

The statement highlighted a severe degradation of physical and institutional assets, noting that the localized drought has "reached a critical threshold" due to a massive drop in the regional water table. This infrastructural failure directly expands human vulnerability and systemic risk, explicitly captured by the reality that older shallow boreholes have failed, turning basic water access into a dangerous "health risk" for elderly grandmothers. The verbatim reflection that vulnerable residents are skipping meals and medication underscores a compounding humanitarian and "protection crisis," where climate-induced resource scarcity stretches traditional community safety nets beyond their breaking points.

The findings from the study unpacked from participants verbatim has exposed that the raw physical reality of a community lifeblood water is vanishing. Severe drought turns water collection into a punishing physical ordeal for elderly bodies that are already weak or arthritic. In Australia DAFF indicated that climate driven water scarcity increases pressure on water resources heavily affecting agriculture productivity. The severe water crisis and its specific impact on the elderly in Rushinga match the findings of MacDonald et al. (2012) who confirmed that prolonged droughts in arid parts of Africa cause severe drops in groundwater tables causing shallow wells and older hand-pump boreholes to dry up completely. The groundwater table has dropped so low that even the major local river, Nyatsato, has dried up forcing people to engage in sand-scooping to extract small amounts of muddy contaminated water. When water is scarce, the entire social structure breaks down. Research by Gukurume (2013) in rural Zimbabwe showed that climate-induced water scarcity disproportionately affects vulnerable groups like the elderly. This showed that If an

elderly person cannot walk 6 kilometers, and the family network fails to help them, their basic human rights like taking medication with food and water are violated. However, Cleaver (2012) argued that water scarcity in rural communities is often caused by institutional neglect and a lack of borehole maintenance rather than purely environmental climate change

The Sustainable Livelihoods Framework showed how severe water scarcity completely cripples a household's survival assets. On Vulnerability Context the extreme drop in the water table is an ongoing environmental shock that changes everything for the worse. If this water crisis is left unaddressed there will be a rise in water-borne illnesses among the older generation, livestock which often serve as an elder's primary financial savings account will die stripping families of their economic security. However, this visible crisis provides an opportunity for NGOs and government agencies to bypass shallow wells and invest in Climate-Resilient Infrastructure.

4.4.2 Increased Health Risks

Increased health risks are also emerged as a challenge being faced by the elderly in Nyatsato, Rushinga. Participants highlighted a distressing surge in severe health risks and climate-sensitive diseases directly linked to extreme weather conditions. They emphasized that relentless heatwaves and chronic dehydration are causing a spike in cardiovascular emergencies, high blood pressure and severe physical exhaustion among the elderly. Furthermore, participants noted that erratic rainfall patterns have created stagnant water pools across the communal lands sparking a dangerous resurgence of vector-borne and water-borne illnesses like malaria and diarrheal diseases. This can be expressed with accounts of participant who had thus to say.

"My body feels as if it is being carried over burning coals. Long ago, we didn't know anything about things called high blood pressure (BP) or dizziness that makes you collapse to the ground, but nowadays this heat of the sun drains all your energy. If you try to just walk to the grinding mill, you feel your whole body completely exhausted and weak, as if you are about to breathe your last breath because of the intense heat." (P6)

The statement highlighted a severe escalation in physiological stress and climate-induced health vulnerabilities, noting that the intensifying ambient heat "feels as if it is being carried over burning coals." This extreme thermal pressure directly undermines physical well-being and daily functioning, explicitly captured by the reality that community members face unprecedented conditions of "high blood pressure (BP) or dizziness that makes you collapse." The verbatim reflection that simple tasks like walking to the grinding mill leave individuals "completely exhausted and weak" underscores how acute climate stress compromises basic human capital and survival capacity. Another participant has thus to say.

"*Diseases have flooded this area because of water that is unsafe and poorly managed. Flies and mosquitoes are troubling us more than ever before, and malaria is viciously taking away our elderly, along with diarrheal diseases. For us, our strength is already depleted, so if a disease catches you, it easily overpowers you*." (P14)

The statement highlighted a severe escalation in biological and human capital vulnerabilities, noting that preventable "diseases have flooded this area because of water that is unsafe and poorly managed." This environmental and infrastructural breakdown directly accelerates health crises among the most vulnerable demographics, explicitly captured through the reality that a rise in vectors like flies and mosquitoes allows malaria and "diarrheal diseases" to viciously target the elderly. The verbatim reflection that the aged population's "strength is already depleted" underscores how climate-induced health shocks easily overpower weakened immune systems, compounding the community's overall socio-ecological crisis. Another participant had thus to say.

"We are seeing a clear correlation between the heatwaves and the spike in cardiovascular emergencies among our elderly patients. Many of them are chronically dehydrated because they prioritize the little water, they have for cooking rather than drinking. The erratic rains have left many stagnant pools in the communal lands leading to a resurgence of malaria. The elderly is our highest risk group because their immune systems are compromised by age and poor nutrition, yet they are the ones forced to do the most physical labor in this harsh climate. It's a recipe for high mortality if we don't implement age-specific health interventions". (K2)

The statement highlighted a severe escalation in climate induced public health risks and systematic vulnerability not a clear correlation between the heatwaves and the spike in

cardiovascular emergencies among older demographics. This environmental strain directly compounds physiological stress explicitly captured through the reality that elderly individuals are chronically dehydrated as they prioritize the little water, they have for cooking rather than drinking. The verbatim warning that a resurgence of malaria alongside severe physical labor a creates a recipe for high mortality underscores an urgent need for age specific health interventions to protect compromised immune system from climate shocks.

The findings from the study unpacked from participants verbatim has exposed that climate change in Nyatsato has progressed from an environmental crisis to a full-blown humanitarian and medical emergency. The health crises described by the participants perfectly mirror Medical literature by Watts et al. (2018) in The Lancet confirmed that global heatwaves are directly responsible for a worldwide spike in cardiovascular deaths, strokes and acute kidney injuries among people over the age of 65 . This showed that the extreme heatwaves are causing immediate severe physical strain on elderly cardiovascular systems. Participant description illustrates how extreme heat acts as an unmanageable physical shock to an aging body. This calculated sacrifice directly triggers heat strokes and organ stress. Erratic rainfall patterns don't always mean total dryness they create small stagnant puddles that act as perfect breeding grounds for mosquitoes and flies. Caminade et al. (2014) which proved that changing rain patterns and rising temperatures expand the breeding habitats of Anopheles mosquitoes, causing malaria to surge in African communities that previously had low transmission rates. This is also congruent with the Global studies which articulated that rising temperatures and changing rainfall patterns create favorable conditions for diseases such as malaria, cholera, and respiratory illnesses (PAPE, 2024).This has unleashed a double wave of malaria and diarrheal diseases onto a highly vulnerable populace. However, Roll Back Malaria initiatives argue that large-scale institutional distributions of insecticide-treated bed nets and modern anti-malarial medications are highly effective at keeping mortality rates down, independent of climate trends. Aging combined with poor nutrition due to crop failures leaves the elderly with depleted physical strength meaning diseases that younger adults might survive are fatal to them.

The SLF helped understand how these health risks represent a catastrophic assault on a household's most basic survival asset. If age-specific medical interventions are not put in place immediately the community faces a rapid increase in preventable deaths among its elderly population, healthcare expenses will bankrupt vulnerable families and disease saps the

physical strength of the community's remaining farmers vast tracts of agricultural land will be left completely uncultivated plunging the entire region into deep aid dependency. However, this creates set up of Mobile Elderly Health Clinics that travel directly into villages and paves the way for community-led environmental health. Thus, one can argue that the elderly in Nyatsato are facing health challenges due to climate change.

4.4.3 Limited Economic Resources

Limited economic resources also emerged as a challenge being faced by the elderly due to climate change. Participants explained that climate change has systematically dismantled their traditional economic foundations trapping them in deep financial poverty. They highlighted that their primary forms of wealth such as livestock which acted as their living banks and cash crops like maize, sorghum and cotton have been wiped out by severe droughts and a lack of pasture. As a result, older residents are left with zero disposable income leaving them unable to afford basic household necessities like soap. The community expressed that their reliance on tiny monetary gifts from children in urban areas is insufficient as the youth are also struggling. This total loss of purchasing power means elders cannot buy drought-resistant seeds or hire farming labor leaving them completely broke and unable to recover from ongoing climate shocks. This can be expressed with accounts of participants who had thus to say.

"Long ago, cattle were our bank; whenever a problem arose, you would sell one and take care of your family. But nowadays, the grass is dried up, and the granaries no longer have any maize to keep these animals alive. The cattle are just dying from hunger, so our wealth is completely gone. There is no money to even buy simple soap because the maize, sorghum, cotton, millet, and cowpeas that we used to sell are no longer there." (P7)

The statement revealed a catastrophic erosion of financial and natural capital within the community's asset portfolio, where the historical memory that "cattle were our bank" establishes a reliable baseline of traditional economic security and resilience. This compounding climate distress directly destabilizes household livelihoods, explicitly captured through the reality that severe pasture depletion and empty granaries mean "the cattle are just dying from hunger." The verbatim reflection that the loss of primary cash crops like maize, sorghum, and cotton leaves households without money to buy "simple soap" underscores how

systemic ecosystem collapse completely obliterates rural wealth and purchasing power over time. Another participant has thus to say.

"*We are only surviving on money sent by our children, but that money is too little because they themselves are struggling in the cities. Long ago, I used to sell green vegetables, tomatoes, (wild fruit), and (baobab fruit), but there is no longer any water to make that possible. My wealth used to be in the soil, but nowadays, that soil no longer gives me any money." (P9)*

The statement highlighted a severe depletion of natural capital and localized economic resilience, noting that households "are only surviving on money sent by our children" who are themselves struggling under urban economic strains. This acute environmental degradation directly destabilizes traditional livelihoods, explicitly captured through the reality that a lack of water prevents the harvesting and sale of "green vegetables, tomatoes, (wild fruit), and (baobab fruit)." The verbatim reflection that "my wealth used to be in the soil, but nowadays, that soil no longer gives me any money" underscores how ecological collapse completely obliterates rural asset portfolios and independent purchasing power. Another participant has thus to say.

"*The economic resilience of the elderly in Nyatsato has been completely hollowed out. They are caught in a cycle where they spend the little cash they get from remittances on overpriced grain because their own fields failed. They have no surplus to sell, meaning their disposable income is non-existent. This lack of financial capital means they cannot buy drought-resistant seeds or pay for the labor they so desperately need. It's a poverty trap where climate change destroys their assets and their lack of assets makes it impossible for them to adapt to climate change*." (K1)

The statement highlighted a severe hollowing out of economic resilience and financial capital among the elderly, noting that they are trapped in a cycle where they must spend "little cash they get from remittances on overpriced grain." This compounding climate stress directly paralyzes household adaptive capacity, explicitly captured through the reality that a lack of surplus and disposable income means "they cannot buy drought-resistant seeds or pay for the labor" they desperately need. The verbatim conclusion that it is a profound "poverty trap where climate change destroys their assets and their lack of assets makes it impossible for

them to adapt" underscores the systemic vulnerability of older generations facing irreversible asset depletion.

The findings from the study unpacked from the participants verbatim has illustrated how environmental destruction directly translates into financial ruin. In rural Shona culture livestock are not just animals they are a household's financial savings account and safety net. The financial struggles described by the participants is supported by Mavedzenge et al. (2008) who wrote extensively on how livestock act as critical asset stores and safety nets in rural Zimbabwe. This strip the elderly of their financial cushion against emergencies. These elders were self-reliant entrepreneurs. They didn't just grow grains they grew cash crops like cotton and gathered wild fruits to sell and the drying landscape has wiped out both their farmed crops and wild resources leaving them with absolutely nothing to sell. Relying on children in the city used to be a reliable backup strategy. However, economic hardships in Zimbabwe's urban centers mean the youth are struggling too. Research by Dzingirai et al. (2015) confirmed that due to economic stagnation in Zimbabwe's cities, urban-to-rural financial remittances have shrunk s, leaving rural elder highly vulnerable to droughts and this shows that The money sent home is small and immediately eaten up by inflation and high food prices It takes money to fight climate change by buying expensive hybrid seeds, hiring young labor to dig conservation plots. Because the weather has stolen their money, they cannot buy the tools needed to adapt ensuring that the next drought will hit them even harder. This is also in line with the studies by CEPAW (2025) which propounded that in Australia older rural farmers face lower superannuation returns due to drought driven economic volatility limiting their ability to pay for adaptive measures. However, Barrett et al. (2001) argue that when farming fails, rural households naturally adapt by shifting to non-farm economic activities like basket weaving, small-scale trading, or tailoring.

The Sustainable Livelihoods Framework helped in map how the destruction of physical and natural assets completely zeros out. If this economic collapse continues Socially, there will be a complete loss of dignity and an increase in mental health struggles among elders. Economically, the community will fall into absolute destitution, creating a situation where households completely lack the cash to access necessities. However, this clear economic breakdown shows development organizations exactly where to target financial assistance. Thus, one can say that limited economic resource is a challenge being faced by the elderly in Nyatsato due to climate change.

4.3.4 Migration of younger people

Migration of younger people also emerged as a challenge being faced by the elderly in Nyatsato due to climate change. Participants expressed deep sorrow over the severe social isolation and abandonment they face due to the mass migration of young people fleeing climate-induced hunger. They highlighted that villages are now largely populated only by frail elders and very young grandchildren, creating a dangerous care vacuum where older people have no one to assist them during nighttime medical emergencies or to help with heavy household chores. The participants emphasized that this loss of youth labor has forced them to abandon their agricultural fields to weeds, as they are physically unable to manage the land alone. The psychological toll is profound, leaving elders in a state of emotional bereavement, constantly watching empty roads for children who may never return, while the traditional family safety net entirely collapses. This can be expressed with accounts of participants who had thus to say.

"In this village, only mice and old people are left living here. All my children fled the hunger and went to Mozambique, so I am left behind as a caretaker of orphans and grandchildren. If you happen to fall sick at night, you can't find anyone to even fetch a cup of water to give you because the grandchildren are still toddlers and will be fast asleep. We are dying in our blankets because no one has the strength to look after the other." (P8)

The statement highlighted a severe depletion of social capital and an acute demographic imbalance, noting that "only mice and old people are left living here" because of climate-induced migration. This forced displacement of the active labor force directly escalates the vulnerability of those left behind, explicitly captured by the reality that the elderly must act as "caretakers of orphans and grandchildren" with no external support systems. The verbatim reflection that "we are dying in our blankets because no one has the strength to look after the other" underscores a tragic collapse of traditional safety nets, leaving isolated individuals facing severe protection and health risks without physical assistance. Another participant had thus to say.

"*Long ago, you would see young men lined up in the fields helping to plow and harvest, but nowadays, my field is left full of weeds because I can no longer manage it by myself. My children left me, saying there is no longer any life here. It hurts so much to sit and*

stare at the road all day long, waiting for a child who is not coming, only hearing the sound of the wind instead of your child's voice." (P11)

The statement reviewed a severe breakdown of social capital and a painful demographic shift, where the memory of "young men lined up in the fields helping to plow and harvest" establishes a reliable historical baseline of communal labor. This out-migration of the youthful labor force directly paralyzes independent agricultural productivity, explicitly captured through the reality that fields are "left full of weeds" because elderly parents cannot manage the intense physical labor alone. The verbatim reflection that parents are left to "sit and stare at the road all day long, waiting for a child who is not coming," highlights the profound emotional trauma and absolute collapse of family-based support systems within climate-stressed rural communities. Another participant has thus to say.

"*Climate change in Nyatsato has triggered what we call involuntary fragmentation of the family unit. The youth are leaving because the rain-fed economy has declined. This leaves the elderly in a state of social bereavement. They are physically too frail to farm using the new climate-smart methods which are labor-intensive, and they are emotionally isolated. The traditional extended family safety net, which was the backbone of rural resilience, is being replaced by a care vacuum that the government and NGOs are struggling to fill.*" (K1)

The statement highlighted a severe disintegration of social capital and institutional safety nets, noting that climate change has "triggered what we call involuntary fragmentation of the family unit." This rural out-migration of active labor directly exacerbates human vulnerability, explicitly captured through the reality that the elderly is left in a state of "social bereavement" and are physically too frail to adopt labor-intensive climate-smart farming methods. The verbatim warning that the traditional extended family backbone is "being replaced by a care vacuum" underscores a critical protection crisis, where institutional intervention is failing to substitute for collapsed intergenerational support systems.

The Findings from the study unpacked from participants verbatim has exposed a silent painful consequence of climate change leading to extreme demographic imbalance in Rushinga. UNSW (2025) stated that in Australia the younger people move to metropolitan areas due to limited job prospects ad drought related agricultural decline leaving elderly individuals in left behind rural areas increasing their vulnerability to extreme heat isolation.

Climate change acts as a push factor driving the able-bodied youth across borders (like into neighboring Mozambique) and leaving behind an unsustainable demographic of the very old and the very young. The social isolation and family fragmentation described in Nyatsato is similar to Research by Mueller et al. (2014) which confirmed that environmental shocks like chronic droughts accelerate rural-to-urban and international youth migration leaving behind an increasingly aging vulnerable agrarian population that cannot sustain itself .This showed a life-threatening danger of this vacuum when the elder suffers a stroke or heart issue at night toddlers cannot help them. They are literally left dying in their blankets from preventable complications due to a lack of immediate human support. Farming requires physical muscle. Without young men and women to clear and plow the land fields turn to weeds. This created a cruel irony and the land is abandoned not just because it doesn't rain but because there is no human labor left to work it. The psychological trauma is heavy. Climate change inflicts deep emotional wounds. The elderly is grieving the living with the constant anxiety of abandonment. However, Adger et al. (2002) argued that youth migration can strengthen rural families through transnational solidarity where migrated youth send back consistent financial remittances that allow elders to hire local labor and live comfortably. However, the realities in Nyatsato directly contradict this theory the youth are fleeing out of desperation and the elders are left without cash or care.

The Sustainable Livelihoods Framework helped understand how climate change destroys Social and Human Capital triggering a complete systemic collapse. The dying, rain-fed economy acts as a continuous macro-shock, forcing the youth to flee the area to survive. If youth migration and the resulting isolation of elders continue unchecked, the community faces a severe rise in neglect-related deaths among the elderly, who may die quietly in their homes with no one nearby to seek medical help. Local food production will experience a permanent freeze; as more fields turn to weeds, the community will become completely dependent on external food aid. However, this severe social crisis provides an undeniable justification for the government and NGOs to step in and design institutional Social Protection Frameworks. Thus, one can argue that migration of younger people is also a challenge being faced by the elderly in Nyatsato, Rushinga.

4.5. Climate Change Adaptation Strategies Among the Elderly in Nyatsato Ward 24, Rushinga, Mt Darwin

In Nyatsato, the elderly is actively using a variety of adaptation efforts include switching to hardy, drought-resistant crops that need very little rain. This section explores the specific ways these resilient elders are adjusting to their changing world to protect their health, their homes, and their independence.

4.5.1 Shifting to Traditional Small Grains

Shifting to traditional small grains is one of the adaptation strategies being utilized by the elderly people in Nyatsato to mitigate climate change. Participants emphasized that shifting from maize to traditional small grains such as sorghum and millet combined with old-fashioned seed-saving practices is a vital strategy for surviving climate change. They highlighted that maize is no longer a dependable crop because it requires too much water and quickly dies during brief dry spells. In contrast, small grains are incredibly tough able to survive long periods without rain and wait for the moisture to return. Participants noted that traditional saved seeds are highly resilient and can be stored safely in granaries for long periods without expensive chemical preservative providing households with a reliable source of food security that they can manage completely on their own. This can be expressed with accounts of participant who had thus to say.

"Maize lacks endurance; it demands too much water. Nowadays, we are returning to sorghum because it can withstand the scorching sun. Furthermore, our traditional seeds can be stored safely in the granary for a long time without needing any chemical preservatives." (P4)

The statement reviewed a conscious shift in agricultural asset management and climate adaptation strategies, where the recognition that "maize lacks endurance; it demands too much water" serves as a critical baseline for changing farming practices. This strategic pivot directly enhances local food security and resilience, explicitly captured through the community's decision to "return to sorghum because it can withstand the scorching sun. The verbatim reflection that traditional seeds "can be stored safely in the granary for a long time without needing any chemical preservatives" highlights the revival of indigenous knowledge as an effective, self-sustaining financial and physical asset against climate-induced resource scarcity. Another participant had thus to say.

"Sorghum and pearl millet are what keep us alive. Even if the rains are delayed, they will just stand there waiting for it. But with maize, if it goes without water for just two weeks, it immediately dies right there in the field." (P12)

The statement highlighted a conscious reliance on resilient natural and physical assets for food security, noting that "sorghum and pearl millet are what keep us alive" under increasingly hostile environmental conditions. This traditional crop selection directly counters climate-induced agricultural failure, explicitly captured through the reality that these indigenous small grains "will just stand there waiting" for delayed rains. The verbatim contrast that maize "goes without water for just two weeks, it immediately dies right there in the field" underscores the vital role of agro-ecological adaptation and indigenous knowledge in mitigating total livelihood collapse during severe dry spells. Another participant had thus to say.

"*The shift to small grains is a restoration of Human Capital. The elderly already knows how to process these grains. By reintroducing them, we reduce the Financial Capital needed for hybrid maize seeds and fertilizers, which they can no longer afford*." (K2)

The statement highlighted a strategic alignment between traditional knowledge systems and economic asset management, noting that "the shift to small grains is a restoration of Human Capital." This agro-ecological adaptation directly reduces reliance on external inputs, explicitly captured through the reality that reintroducing these indigenous crops "reduces the Financial Capital needed for hybrid maize seeds and fertilizers." The verbatim recognition that elderly farmers "can no longer afford" modern industrial inputs underscores how reviving ancestral farming techniques serves as a vital safety net, allowing resource-constrained households to maintain food security without accumulating unsustainable financial debt.

The findings from the study unpacked from participants verbatim has exposed a deliberate and smart return to indigenous agricultural roots as a direct defense against climate shocks. Globally, elderly farmers increasingly shifted from water-intensive staples to drought-tolerant varieties, such as small grains and legumes, to mitigate the risks of erratic precipitation and rising temperatures (Mushore et al., 2021). The participants explicitly contrast the high risk of growing maize with the climate-resilient nature of small grains. The choice to adopt small grains and save traditional seeds is heavily supported by Hadebe et al. (2017) who have

proven that sorghum and millets have deep root systems and high water-use efficiency making them biologically superior to maize in drought-prone regions like Rushinga. Maize has a two-week death window during dry spells whereas traditional grains possess a unique biological endurance they can go dormant, or stand and wait, until the rain finally falls. Modern hybrid seeds require expensive chemical dusts to prevent pest damage during storage and traditional seeds selected and cured using generational techniques can sit safely in a standard village granary without costing a single cent in chemical treatments. Scholars like Mapara (2009) argued that indigenous knowledge systems (IKS) in Zimbabwe provide time-tested, cost-effective environmental adaptation tools that reduce dependence on expensive Western industrial farming methods. This shift is an empowering economic move. Buying commercial hybrid maize seeds and chemical fertilizers every single year requires a lot of cash. Switching to saved small grains breaks this financial dependence, allowing poor elders to farm successfully without needing money they simply do not have. However, Smale et al. (2011) argued that small grains are incredibly labor-intensive to process and produce lower yields per hectare compared to modern hybrid maize during good rain years

The Sustainable Livelihoods Framework illustrated how this strategy helps the elderly rebuild their asset base from the inside out. By saving their own traditional seeds and avoiding commercial fertilizers, this preserves their tiny financial capital .While this strategy is highly effective for food survival it is labor-intensive, requiring farmers to spend endless hours guarding fields against destructive bird swarms and performing grueling physical labor to process the harvest. However, NGOs and government agencies step in with targeted Technological Support such as introducing community-shared mechanical threshing machines and solar-powered grinding mills to eliminate the physical burden of hand-processing the grains. Thus, one can argue that shifting to traditional seeds play a vital role in adapting to climate change.

4.5.2 Small Scale Keyhole Gardening

Small scale keyhole gardening is also an adaptation strategy emerged being utilized by the elderly in Nyatsato to mitigate climate change. Participants highlighted that small-scale keyhole gardening paired with mulching is an exceptionally effective strategy for maintaining food security while coping with physical frailty and water scarcity. They emphasized that

these compact circular gardens are located right within their homesteads eliminating the need to walk long distances to distant fields. By using dry grass and leaves as mulch the elders can lock moisture into the soil allowing their vegetables to survive on very small amounts of water. The participants noted that this technique keeps the soil continuously rich and moist while requiring minimal physical effort making it the perfect farming alternative for older people who no longer have the strength for heavy digging. This can be expressed with accounts of participant who had thus to say.

"*The small garden close to the homestead helps me a lot because I can no longer manage to walk to the distant fields. I use dry grass (mulching) to cover the soil so that the water is not quickly evaporated by the scorching sun." (P6)*

The statement revealed a strategic adaptation of physical assets and spatial positioning, noting that "the small garden close to the homestead helps me a lot" as an effective strategy to mitigate limited physical mobility. This localized resource management directly compensates for declining human capital, explicitly captured by the reality that the individual "can no longer manage to walk to the distant fields." The verbatim reflection that they "use dry grass (mulching) to cover the soil so that the water is not quickly evaporated by the scorching sun" underscores how indigenous conservation practices optimize scarce water resources to maintain household food security amid extreme thermal stress. Another participant had thus to say.

"I only pour a small amount of water where I planted my vegetables, and the soil always stays beautifully moist because of the leaves that we throw inside. It does not require a lot of physical energy compared to going to the big main field." (P 13)

The statement revealed an efficient and adaptive utilization of localized physical and natural assets, noting that "the soil always stays beautifully moist because of the leaves" applied as organic mulch. This conservation strategy directly minimizes the strain on dwindling human capital and physical mobility, explicitly captured through the reality that the individual "only pours a small amount of water" directly onto the targeted crops. The verbatim reflection that this micro-farming approach "does not require a lot of physical energy compared to going to the big main field" underscores how climate-smart, low-input agricultural techniques enable vulnerable or aging individuals to sustain household food security without exhausting their limited physical strength. Another participant had thus to say.

"Keyhole gardens are vital for nutrition security. Because the elderly has limited Physical Capital, this method allows them to produce leafy greens and legumes with minimal irrigation and zero digging once the bed is established." (K1)

The statement highlighted a strategic optimization of localized physical assets and household food production, noting that "keyhole gardens are vital for nutrition security" within climate-stressed environments. This highly efficient agricultural design directly accommodates the realities of declining human capital, explicitly captured through the observation that "the elderly have limited Physical Capital" to dedicate to intensive farming. The verbatim reflection that this intensive method "allows them to produce leafy greens and legumes with minimal irrigation and zero digging once the bed is established" underscores how climate-smart, low-labor innovations can successfully sustain dietary health and safeguard vulnerable populations from systemic food insecurity.

The findings from the study unpacked from participants verbatim has exposed that keyhole gardening combined with mulching acts as a highly successful micro-farming adaptation that beautifully accommodates the limited physical strength of the aged. For an elderly person with aching joints, distance is a major enemy. The participants' praised for keyhole gardens and mulching aligns perfectly with research by the FAO (2018) which showed that keyhole gardens were specifically designed for drought-prone regions and vulnerable groups because they maximize vegetable production in tiny spaces using recycled kitchen wastewater. Shifting production from large distant fields to a small garden right outside the doorstep changes everything. It turns a punishing trek into an easy, manageable task. In a region plagued by heatwaves, bare soil loses water instantly. Mulching acts as a protective blanket that shields the earth from the biting sun preventing evaporation and ensuring the soil stays beautifully moist with just a fraction of a bucket of water. Galhena et al. (2013) argued that home-based micro-gardening is the most reliable way to sustain dietary diversity and health for vulnerable elderly populations who can no longer cope with the heavy physical demands of large-scale farming. A keyhole garden is a raised, circular bed with a central composting basket. Kitchen waste and greywater are poured into the center, naturally feeding the surrounding plants. Once built, it requires zero digging, freeing the elderly from the exhausting labor of traditional tillage. However, keyhole gardens are amazing for nutrition security, some market-driven agricultural economists, such as Pingali (2012) argue that these tiny plots cannot produce a financial surplus

The Sustainable Livelihoods Framework demonstrated how keyhole gardening helps elders protect their assets while navigating a harsh climate. By creating a self-sustaining microclimate at home, elders shield themselves from external climate shocks like hot winds and drying rivers that destroy the main fields. Keyhole gardening are strictly designed for small-scale household consumption, they cannot produce staples like maize or sorghum in large quantities .However, the community's enthusiastic adoption of keyhole gardening thrive on household greywater, turns domestic wastewater into a valuable asset empowering vulnerable older adults to sustainably grow their own food all year round. Thus, one can argue that small scale keyhole gardening is an adaptation strategy being utilized by the elderly in Nyatsato for climate change mitigation strategies.

4.5.3 Harvested Rainwater

Harvesting rainwater is also an adaptation strategy emerged being utilized by the elderly to mitigate climate change. Participants explained that rainwater harvesting, and greywater reuse have become indispensable strategies for surviving severe water shortages and easing physical labor. They highlighted that whenever it rains, they use pots, drums and small ditches dug around the homestead to catch every possible drop of water running off roofs and yards. To maximize this scarce resource, the elders immediately recycle their domestic greywater such as leftover bath or laundry water to irrigate their backyard fruit trees and vegetable crops. The participants emphasized that this continuous recycling cycle acts as a critical lifeline that keeps their crops alive while sparing frail older residents from the dangerous physical strain of fetching heavy buckets of water from distant, unreliable boreholes. This can be expressed with accounts of participant who had thus to say.

"Nowadays, when it rains on the thatched roof, we trap the water using pots and drums. The water that I use to bathe the children is the exact same water I use to irrigate my fruit trees." (P7)

The statement revealed a highly resourceful adaptation of physical assets and water management strategies, noting that "when it rains on the thatched roof, we trap the water using pots and drums." This immediate localized conservation directly counters severe climate-induced resource scarcity, explicitly captured by the reality that households must rely on rudimentary rainwater harvesting to build up their basic domestic supplies. The verbatim reflection that "the water that I use to bathe the children is the exact same water I use to

irrigate my fruit trees" underscores how cascading water-reuse practices and circular resource management are essential to sustaining household food security and hygiene when traditional water sources fail. Another participant had thus to say.

"*If we just sit and wait for a borehole to be drilled, we will perish while waiting for a miracle. It is much better to dig a small trench to catch the rainwater coming from the yard so that the crops do not die of thirst. Reusing water is the only way left for us*." (P 14)

The statement revealed a proactive shift in community agency and physical asset management, noting that "if we just sit and wait for a borehole to be drilled, we will perish while waiting for a miracle." This self-reliant approach directly counters institutional delays and acute climate-induced resource scarcity, explicitly captured by the decision to "dig a small trench to catch the rainwater coming from the yard" to prevent total crop failure. The verbatim reflection that "reusing water is the only way left for us" underscores how localized micro-harvesting and circular conservation practices become indispensable survival mechanisms when traditional infrastructural support systems break down. Another participant had thus to say.

"*Water harvesting at the household level is the most effective way to protect the Physical Capital of the elderly. It reduces the health risks associated with carrying heavy 20-liter buckets over long distances, which is the primary cause of spinal issues among the aged here*." (K2)

The text highlighted a critical intervention for safeguarding human and physical capital within climate-stressed environments, noting that "water harvesting at the household level is the most effective way to protect the Physical Capital of the elderly." This decentralized infrastructural adaptation directly mitigates severe physiological strain and systemic health risks, explicitly captured through the reality that it reduces the burden of "carrying heavy 20-liter buckets over long distances." The verbatim reflection that this strenuous physical labor "is the primary cause of spinal issues among the aged here" underscores how localized resource management serves as an essential protection mechanism, preventing irreversible physical degradation among the most vulnerable demographics.

The findings from the study unpacked from participants verbatim has exposed that rainwater harvesting and greywater recycling are not just environmental concepts they are highly practical life-saving resource management strategies born out of pure necessity. Contraptual (2023) stated that rainwater harvesting is vital, and the Indians introduced the Khadin system a traditional water harvesting method involving the creation of embankments to collect runoff which is still practiced increasing soil moisture. The participants' reliance on household water-harvesting and recycling methods is heavily backed by Kahinda et al. (2007) who articulated that South Africa confirm that domestic rainwater harvesting is a highly effective, low-cost adaptation strategy that provides immediate water security for vulnerable, poor households during dry spells. In an area with erratic rainfall, water cannot be taken for granted. Instead of throwing away water used for bathing or domestic chores, it is given a second life to feed food-producing plants, ensuring no water goes to waste. Research by Al-Hamaiedeh and Bino (2010) proved that using untreated household greywater for home gardening is a safe and highly sustainable way to maintain vegetable and fruit production in water-scarce rural environments. Rather than waiting passively for local government or donors to fix broken boreholes which they view as waiting for a miracle they take control by digging small trenches to capture surface runoff directly into their homestead plots. However, safely uses bath water for fruit trees, some environmental health scientists, such as Finley et al. (2009) caution against long-term, unregulated greywater reuse. They argue that untreated household greywater can contain high levels of harmful pathogens. This strategy is an important health shield. Carrying a 20-liter bucket of water over long distances is physically punishing for an aging spine. Harvesting water right at the doorstep eliminates this dangerous chore.

The Sustainable Livelihoods Framework demonstrated how home-based water management allows the elderly to defend and rebuild their survival assets. By trapping rainwater and recycling greywater, elders are artificially boosting the amount of water available on their land. This greywater if left untreated will could eventually poison the soil, making it too salty or alkaline for plants to grow in the future and storing harvested rainwater in open drums and pots around the house provides perfect breeding grounds for mosquitoes leading to malaria. However, the elders' enthusiastic embrace of rainwater harvesting and greywater reuse opens NGOs and local authorities to step in to provide Simple Technological Enhancements such as installing low-cost gutters; Thus one can say that harvesting rain water

plays a crucial role as an adaptive strategy being utilized by the elderly in Nyatsato to mitigate climate change.

4.5.4 Strengthening Peer Support Networks

Strengthening peer support networks is also an adaptation strategy emerged that is being utilized by the elderly to mitigate climate change. Participants explained that strengthening peer support networks and informal labor-sharing groups has become a crucial strategy for survival in the face of physical frailty and abandonment. They highlighted that because their children have migrated away due to climate pressures, the elderly have stepped in to become each other's children. By gathering to work collectively rotating from one person's field to another they can accomplish demanding farming tasks that would be physically impossible to manage alone. Furthermore, participants noted that these networks extend far beyond field labor they act as a vital social emergency system where members gather to fetch water, collect firewood, and care for one another during illness, turning collective isolation into shared strength and emotional comfort. This can be expressed with accounts of who had thus to say.

"*We, the elderly women of Nyatsato, are now helping each other. Today we are in my field, tomorrow we are in another's. Our individual strength is very little, but when we are many, the work moves forward while we are laughing."* (P8)

The statement revealed a powerful mobilization of social capital and collective human agency, noting that "we, the elderly women of Nyatsato, are now helping each other" to overcome individual physical limitations. This collaborative safety net directly counters the severe labor deficits caused by climate-induced youth out-migration, explicitly captured through the rotation strategy where "today we are in my field, tomorrow we are in another's." The verbatim reflection that "our individual strength is very little, but when we are many, the work moves forward while we are laughing" underscores how communal solidarity and mutual aid networks transform emotional isolation into productive resilience, keeping local food production alive. Another participant has thus to say.

"The children left for Johannesburg, so we have now become each other's children. If one of us falls sick, we gather and go to fetch water or look for firewood for them. If you stay isolated by yourself, you will be eaten by the dust." (P14)

The statement revealed a powerful reconstruction of social capital and communal safety nets, noting that because "the children left for Johannesburg, so we have now become each other's children." This intentional mutual aid network directly counters the severe emotional and physical isolation caused by youth out-migration, explicitly captured through the collective response that "if one of us falls sick, we gather together and go to fetch water or look for firewood for them." The verbatim warning that "if you stay isolated by yourself, you will be eaten by the dust" underscores how active solidarity and community-led care systems are indispensable for the basic survival of vulnerable elders left behind in climate-stressed regions .Another participant had thus to say;

"*Horizontal Social Capital is the only remaining safety net. By formalizing these peer support groups, the elderly can negotiate for resources collectively and overcome the labor shortages caused by the rural-to-urban migration of the productive age group*." (K1)

The statement highlighted a strategic formalization of social capital and collective human agency, noting that "Horizontal Social Capital is the only remaining safety net" within the community. This institutionalized peer network directly mitigates the severe labor and economic deficits altering rural demographics, explicitly captured through the strategy that "by formalizing these peer support groups, the elderly can negotiate for resources collectively." The verbatim reflection that this collaboration allows them to "overcome the labor shortages caused by the rural-to-urban migration of the productive age group" underscores how structural solidarity becomes an essential mechanism for survival when traditional family-based safety nets dissolve.

The findings from the study unpacked from participants verbatim has showcase a beautiful, deeply human story of communal resilience, demonstrating how a vulnerable group can turn to one another to build an informal shield against hardship. While a single aging body easily breaks down under intense field labor, a group of elders working together can get the job done. The survival strategies and social bonds described by the participants align closely with Mapfumo et al. (2016), who argued that indigenous labor-sharing practices are highly

effective tools for food-insecure households to overcome acute labor shortages without spending cash. This tells that labor-sharing does not just relieve physical stress as it provides vital mental health therapy and joy, cutting through the heavy cloud of loneliness. climate-driven economic collapse has forced young people to migrate to places like Johannesburg, the traditional vertical safety net is completely broken. Research by Schatz et al. (2015) in Southern Africa confirmed that as youth migration hollows out rural communities, older adults frequently form informal peer support networks to substitute for missing institutional care and parental support. To survive, the elderly has re-engineered their social rules, choosing to act as an adopted family for one another. Peer support is not restricted to agriculture. It is a daily, life-saving emergency system. In a village where water and wood require physical travel an elder who falls sick faces immediate life-threatening deprivation. The group steps in to cover these basic needs, ensuring that isolated individuals are not left to be eaten by the dust a powerful metaphor for dying alone and forgotten. this is a prime example of Horizontal Social Capital. When institutional help or family support vanishes, this lateral bond becomes the absolute last line of defense. However, Traditional market economists, such as Popkin (1979) argued that under extreme economic and environmental stress, individuals tend to become highly self-interested and protective of their own small resources, causing communal networks to fracture rather than strengthen.

The Sustainable Livelihoods Framework perfectly illustrated how these peer networks allow the elderly to use their social connections to completely bypass their lack of physical and financial resources. These peer networks carry several hidden vulnerabilities as the elders are spending their limited energy clearing each other's plots, they risk accelerating their own physical burnout, joint degradation, and chronic fatigue. However, donor agencies can leverage these existing groups to distribute Targeted Community-Level Support such as giving these specific networks shared agricultural tools. Thus, one can argue that strengthening social network groups is a significant strategy utilized by the elderly in Nyatsato ward 24 to mitigate climate change.

4.6 Chapter Summary

In summary, this chapter critically analyzed the climate change experiences of the elderly in Nyatsato through the lens of the Sustainable Livelihoods Framework, revealing a community

where social and human capital are being strained to their limits. The findings illustrated a complex landscape where traditional ecological knowledge and spiritual interpretations of environmental shifts collide with the harsh physical realities of water scarcity thermal violence and the erosion of livestock-based financial security. While the demographic profile of the participants highlighted significant vulnerabilities particularly the missing middle generation and high rates of formal illiteracy the discussion underscores the remarkable agency of the aged. By pivoting to drought-resistant small grains and leveraging communal labor-sharing networks the elderly demonstrates that resilience in Rushinga is not merely about surviving environmental shocks but about adapting ancestral wisdom to meet the unprecedented demands of a changing climate.

CHAPTER 5 : SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This Chapter 5 contains the summaries of the key results obtained in the current research focusing on the experiences of the elderly on climate change adaptation strategy in Rushinga, Nyatsato Ward 24. In this chapter, the key findings presented in previous sections will be analyzed and discussed to shed more light on the main aspects of the study. On the basis of the literature review carried out and the methodology provided in previous chapters this chapter synthesizes and analyzes the key results

5.2.1 Summary of Findings

This research investigated the experiences of the elderly aged 60+ regarding climate change adaptation strategies in the Nyatsato ward 24 of Rushinga District, Zimbabwe. The study established its foundation by outlining a chapter hierarchy that transitions from a global, regional and national background on climate-induced elderly vulnerability such as extreme heat, drought, and the collapse of remittance economies to a problem statement highlighting how environmental degradation and socio-economic shifts trap older adults in a cycle of marginalization. Guided by the Sustainable Livelihoods Framework (SLF) to analyze the depletion of natural, physical, human, financial, and social capitals, the literature review explores perceived causes of climate change, distinct physiological and economic challenges and localized adaptation strategies like cultivating small grains, water harvesting, and leveraging horizontal social capital. Methodologically, the study adopted an interpretivist philosophy and a qualitative case study design, utilizing purposive and criterion sampling to select 16 participants comprising 14 elderly residents and 2 institutional key informants to gather rich data through 6 in-depth interviews, 2 focus group discussions each with 4 participants and 2 key informant interviews. Finally, the gathered narrative data is processed using a systematic six-step thematic analysis framework, while empirical rigor and participant safety are rigorously maintained through established trustworthiness criteria that is credibility, dependability, transferability, and confirmability alongside strict ethical safeguards including informed consent, confidentiality, anonymity and non-maleficence.

5.2.2 Perceived Causes of Climate Change by the Elderly in Nyatsato ward 24 of Rushinga Mt Darwin

In the rural Nyatsato, elderly residents perceived climate change not through abstract global science but as a severe, physical, and spiritual breakdown of their socio-ecological landscape. Analyzed through the lens of the Sustainable Livelihoods Framework (SLF), their feedback highlights how interconnected environmental shocks such as widespread deforestation, a broken agricultural calendar marked by violent erratic rainfall and unbearable labor-limiting extreme heatwaves rapidly deplete their natural, human, and financial capital. This localized desertification and agricultural exhaustion are further interpreted by the elders as a cosmological crisis where the abandonment of traditional cultural taboos, ancestral rites and respect for nature has caused a moral fracturing that alienates life-giving water spirits and spiritual protection.

5.2.3 Challenges experienced by the Elderly due to climate change in Nyatsato ward 24 of Rushinga, Mt Darwin

In Nyatsato, climate change has evolved from an environmental threat into a devastating humanitarian and social protection crisis that systematically dismantles the survival assets and health of the elderly. Analyzed through the lens of the Sustainable Livelihoods Framework (SLF), prolonged droughts and intense heatwaves have caused a drastic drop in the water table, turning essential water sources into a grave of dust and forcing frail, arthritic elders to walk hazardous distances for contaminated water. This extreme thermal stress and chronic dehydration directly trigger immediate cardiovascular emergencies and fainting-inducing spikes in blood pressure, while erratic rain bursts leave stagnant pools that fuel a deadly resurgence of malaria and diarrheal diseases among an age-compromised, undernourished population. The drying up of pastures has bankrupt the traditional cattle banks and eliminated cash crop incomes, trapping elders in a poverty loop where they lack the financial capital to buy hybrid seeds or adapt. To escape this collapsing rain-fed economy the able-bodied have migrated generating a profound care vacuum and a state of emotional bereavement that leaves isolated grandmothers to care for toddlers alone, unable to perform labor-intensive conservation agriculture.

5.2.4 Climate Change Adaptation Strategies by the Elderly in Nyatsato ward 24 of Rushinga Mt Darwin

Confronted by the multi-layered socio-ecological crisis in the Nyatsato, the elderly is demonstrating remarkable agency by utilizing an integrated suite of indigenous, agroecological, and communal coping tactics to actively defend their households from total climate ruin. Synthesized through the lens of the Sustainable Livelihoods Framework (SLF), these resilient elders are strategically restoring their human and financial capital by shifting cultivation away from fragile, water-heavy maize back to indigenous small grains like sorghum and pearl millet leveraging the biological dormancy of these traditional crops and self-reliant, chemical-free seed-saving systems to completely bypass high-priced, inaccessible commercial inputs. To reconcile their declining physical capability with severe climate shocks, they are establishing compact, home-based keyhole gardens protected by organic surface mulching, transforming recycled domestic greywater and trapped rainwater into a vital agricultural lifeline that eliminates the hazardous physical burden of carrying 20-kilogram water buckets over long distances to broken public boreholes. Finally, to counteract the devastating care vacuum and agricultural paralysis triggered by mass youth migration, the elders have re-engineered the rural social fabric by mobilizing horizontal social capital, organizing themselves into rotational, communal labor-sharing groups where they become each other's children to jointly weed fields, gather firewood and provide emotional and medical relief to the sick.

5.3 Conclusion

In conclusion, this research demonstrated that elderly residents in the rural Nyatsato ward 24 of Rushinga do not conceptualize climate change through abstract, global scientific frameworks but as an immediate, physical, and deeply spiritual breakdown of their socio-ecological landscape. The intersection of severe environmental shocks manifested through extensive deforestation, an erratic agricultural calendar and unbearable heatwaves has severely depleted their baseline asset portfolio transforming localized desertification into a profound cosmological crisis. The elders interpreted these shifts as a moral fracturing caused by the abandonment of traditional cultural taboos and ancestral rites which they believe has alienated protective spirits and life-giving water entities. This localized framing underscores that vulnerability is as much cultural and spiritual as it is material. This finding aligns significantly with the assertions of Mapara (2009) who argues that African indigenous

knowledge systems interpret environmental degradation through a holistic lens where the cosmic, human, and natural worlds are inextricably linked.

Furthermore, the investigation established that climate change has graduated from an environmental threat into an acute humanitarian and social protection emergency that systematically unravels the physical health and economic security of the aged. The dropping water table imposes grueling physical labor on arthritic elders inducing severe thermal stress, dehydration, and spikes in blood pressure while erratic downpours generate vector breeding pools that drive up malaria incidences in an already undernourished population. Economically, the collapse of livestock cattle banks and rain-fed cash crops has trapped the elderly in a severe poverty loop, while the resultant mass migration of able-bodied youth has triggered a devastating care vacuum and profound emotional bereavement leaving isolated grandmothers to care for dependents without the physical capacity for intensive labor. This grim reality is strongly congruent with the findings of Schatz et al. (2015) who documented that rural-to-urban youth migration in Southern Africa leaves an increasingly frail elderly population to absorb systemic environmental and economic shocks without formal institutional support networks. Conversely, it challenges classic modernization theories by Rostow (1960) which naively presume that urban economic migration smoothly yields steady, compensatory financial remittances capable of universally insulating rural households from localized poverty.

Finally, the study concluded that despite their immense physical frailty and systemic marginalization, the elderly of Nyatsato are not passive victims but active agents of resilience, deploying a sophisticated mix of indigenous, agroecological, and social coping mechanisms. By strategically substituting water-heavy maize with resilient, dormant-capable traditional small grains like sorghum and pearl millet and adopting self-reliant seed-saving, they effectively protect their dwindling financial capital from commercial dependency. This agricultural defense is bolstered by home-based micro-farming innovations specifically keyhole gardening, organic mulching, and the circular recycling of domestic greywater and rainwater which dramatically minimizes physical strain and protects their declining human capital. Moreover, by reviving traditional horizontal social networks like rotational labor-sharing, they successfully bridge the care vacuum to become each other's children in times of illness and labor deficits. This active community-led defense aligns perfectly with the theories of Woolcock and Narayan (2000) on the power of horizontal bonding capital as a

vital survival mechanism for marginalized groups navigating institutional voids. However, it stands in stark contrast to the individualistic, market-driven adaptation frameworks championed by economists like Popkin (1979) who argue that extreme resource scarcity inevitably fractures communal solidarity into self-interested, atomized competition.

5.4 Implications for Social Work Practice

The findings of this study in Nyatsato, Rushinga, demand a profound re-evaluation of social work practice, urging the discipline to step out of traditional office spaces and directly into the heart of environmental crises. Social work has historically focused on fixing interpersonal relationships or addressing financial poverty, but this research forcefully pulls the profession into the emerging realm of Eco-Social Work or Green Social Work. It proves beyond a doubt that environmental degradation is not just an ecological issue it is a human rights violation, a social injustice, and a direct threat to human life. For social workers, this means that assessing a person's well-being must now include assessing their physical environment understanding that a dried-up riverbed or a blazing heatwave is just as damaging to a human life as an economic depression.

Adding on, this study carries critical implications for how social workers design and advocate for social protection policies in rural Zimbabwe. This research shows that temporary, erratic food handouts from donors are mere band-aids that do nothing to stop this systemic collapse. Social workers must use these findings to lobby the government and international NGOs for shock-responsive, institutional social protection. This means pushing for universal, reliable social cash transfer pensions that give elders the financial independence to buy food and climate-resilient resources without destroying their health. Furthermore, because this research directly links climate stressors to immediate medical emergencies like heat-induced blood pressure spikes and malaria social workers must partner with public health teams to establish mobile, rural geriatric clinics that bring life-saving healthcare straight to the doorsteps of isolated homesteads.

Moving on, this research offers a powerful blueprint for a decolonial, culturally sensitive approach to community social work. For too long, top-down development projects have failed because they arrive with foreign, industrialized solutions that ignore local realities. This study shows that the elders of Nyatsato interpret this crisis through their own rich cultural and spiritual worldview, linking the changing weather to a breakdown in ancestral

rites and a loss of respect for nature's taboos. Instead of dismissing these beliefs, social workers must practice deep cultural humility, embracing Indigenous Knowledge Systems (as a legitimate and highly effective tool for community mobilization.

The way elders have mobilized their own horizontal social capital re-engineering the social fabric to become each other's children through rotational labor groups is a masterclass in grassroots resilience. The role of the social worker is to step in as a structural bridge to provide linking capital. Since these high-trust peer networks are rich in spirit and knowledge but desperately starved of physical resources, social workers must connect them to external funding and NGOs to secure labor-saving technologies.

5.5 Recommendations of Findings

5.5.1 Recommendations to the Target Population: The Elderly

- **Establish and Formally Register Elder-Led Community Seed Banks and Knowledge Hubs**

The elderly should leverage their extensive indigenous knowledge and successful seed-saving practices by organizing into formal, community-managed seed banks. These hubs will allow them to collectively preserve, multiply and distribute climate resilient traditional small grains like sorghum and pearl millet.

- **Scale Up Collaborative Greywater Recycling and Organic Manure Management**:

To alleviate the grueling physical strain of walking long distances for water and to protect their declining human capital, the elderly should expand their home-based micro-farming by grouping their backyard keyhole gardens. They should collectively implement organic manure management utilizing waste from their remaining small livestock and poultry alongside basic sand-and-charcoal filtration techniques to safely treat household greywater.

5.5.2 To the Government (Policy Change and Development)

- **Transition from Transitory Food Aid to Shock-Responsive Social Protection Policies**:

The Ministry of Public Service, Labor and Social Welfare should structurally reform its rural support frameworks by shifting away from erratic, temporary food handouts toward

predictable, shock-responsive social protection systems. Government policy must be revised to introduce an institutionalized, universal climate-vulnerability social pension tailored specifically for rural elders left behind by youth migration

- **Formulate Integrated National Policies Decolonizing Climate-Smart Agriculture**:

The Ministry of Environment, Climate and Wildlife, in coordination with agricultural extension services (AGRITEX), should formulate inclusive national policies that formally integrate Indigenous Knowledge Systems (IKS) with modern Climate-Smart Agriculture (CSA).

5.5.3 To Civil Society Organizations (CSOs)

- **Design Institutionalized Village-Based Mobile Healthcare and Caregiver Volunteer Networks:**

Civil society and humanitarian organizations operating in Rushinga should move beyond generalized environmental programs and implement age-specific protection interventions. CSOs should fund and deploy mobile geriatric health clinics to directly manage heat-induced cardiovascular emergencies.

- **Equip Communal Rotational Labor Groups with Physical and Asset Injections:**

To bridge the gap between survival and actual climate resilience, civil society should target existing, high-trust horizontal peer networks formed by the elders. NGOs should strategically inject physical and linking capital into these rotational labor-sharing groups by supplying them with shared asset packages, including wheelbarrows, donkey-drawn transport carts, and drip-irrigation kits.

5.5.4 Recommendation for Future Studies

- **Conduct Longitudinal Studies on the Nutritional and Eco-Social Intersections of Climate Change**:

Future academic researchers should conduct long-term, longitudinal studies that track the specific multi-layered health and nutritional outcomes of climate-induced water and food scarcity on aging populations in arid regions. There is a critical gap in literature exploring how chronic dehydration and age-related immune decline intersect with the resurgence of

vector-borne illnesses like malaria in shifting microclimates. Expanding research in this field will enrich global academic literature, providing crucial medical and sociological data needed to justify specialized geriatric health policies.

- **Investigate the Quantitative Efficacy of Merging Indigenous Knowledge Systems with Modern Agroecology**:

Academics should pursue comparative, empirical research that quantifies the actual yield and resource-conservation efficiency of combining spiritual/indigenous conservation practices with modern agroecological methods like mulching and keyhole gardening. Future studies should focus on creating participatory action frameworks that measure how effectively horizontal social capital can substitute for lost physical labor.

5.7 Chapter Summary

The findings of this qualitative study revealed that elderly residents in Nyatsato ward 24 of Rushinga do not view climate change through abstract science, but as a deeply physical and spiritual breakdown of their socio-ecological landscape. The investigation established that severe droughts, erratic rains, and extreme heat have escalated into a profound social protection crisis, straining the elders' health, and creating mass youth migration. The elderly individuals actively defend their households by blending indigenous knowledge systems with agroecological practices such as transitioning to drought-tolerant small grains, utilizing greywater recycling, and reviving rotational, communal labor-sharing networks to support one another. These findings demanded that social work transition toward an eco-social, decolonial approach, prompting recommendations for shock-responsive social pensions and future longitudinal research to formally bridge local ancestral resilience with institutional structural support.

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APPENDICES

APPENDIX 1 : In-Depth Interview Guide

Research Topic: The experiences of elderly people on climate change adaptation strategies. The case of Nyatsato ward 24 of Rushinga, Mt Darwin

Location: Nyatsato ward 24 , Rushinga | Interviewer: Rumbidzai Soda

Introduction & Informed Consent

My name is Rumbidzai Soda. Thank you for agreeing to participate in this in-depth interview. I truly appreciate you taking the time to share your story with me. This conversation is intended to provide you with an opportunity to express your personal experiences and perspectives regarding climate change.

I want to assure you that everything you share will remain strictly confidential and will only be used for academic purposes to inform strategies to overcome climate change. Your insights are crucial in shaping a more effective response to this issue. You may choose to stop the interview at any time or skip any question you do not feel comfortable answering."

To start our conversation, can you please tell me a little about yourself, your age, living conditions, and how long have you been in Nyatsato, Rushinga?

SECTION A: Demographic Information

Interviewer Note: Please fill out or tick the appropriate boxes.

Age

_____

Gender

[ ] Male [ ] Female [ ] Other

Marital Status

[ ] Single [ ] Married [ ] Widowed [ ] Divorced/Separated

Educational Level

[ ] No Formal Education [ ] Primary Education

[ ] Secondary Education [ ] Tertiary/Higher Education

Duration of Stay in Nyatsato

_____ Years

Livelihood Type

[ ] Crop Farming [ ] Livestock Rearing [ ] Trading/Business

[ ] Remittances [ ] Government/NGO Support [ ] Other

Village

SECTION B: Perceived Causes of Climate Changes by the Elderly

1. What are the perceived causes of climate change?

_____

2. What changes have you noticed in the weather or environment over the years?

_____

3. Have you noticed any changes in temperature, rainfall, or seasons?

_____

4. How do these changes affect your daily life?

_____

5. What is climate change in your own understanding?

_____

SECTION C: Challenges of Climate Change Among the Elderly

1. What are the challenges of climate change adaptation you are facing?

_____

2. Can you describe a time when weather conditions (e.g., heatwaves, drought, floods) affected you?

_____

3. Have you changed your daily routines because of climate changes?

_____

4. Who do you help/Who helps you cope during extreme weather conditions?

_____

5. Are there community programs or groups that support older people?

_____

SECTION D: Adaptation Strategies being Utilized by the Elderly

1. What are the most effective coping strategies to prevent the effects of climate change?

_____

2. What do you usually do to cope with extreme weather conditions?

_____

3. What makes it difficult for you to adapt to climate change?

_____

4. Are you aware of any government or community efforts to address climate change?

_____

5. Have these efforts helped you in any way?

_____

Conclusion

Concluding Question: Is there anything else you would like to share about your experiences?

_____

Thank you for your time. Your voice will significantly contribute to this research.

End of Interview

Time Interview Concluded: _____

Date of Interview: _____

APPENDIX 2 : Focus Group Discussion Guide

Research Topic: The experiences of the elderly on climate change adaptation strategies: The case of Nyatsato ward 24 of Rushinga, Mt Darwin.

Location / Facilitator:

Nyatsato, Rushinga | Facilitator: Rumbidzai Soda

Introduction & Opening Remarks

Good day everyone, and welcome. Thank you all for taking this time to attend and be part of this discussion. My name is Rumbidzai Soda and I will be facilitating this session. The purpose of our discussion is to share experiences, ideas, and perspectives in an open and supportive environment where everyone feels comfortable contributing.

Before we begin, I would like to emphasize that there are no right or wrong answers; every opinion shared here is valuable and important. We encourage honesty and openness, and we assure you that everything discussed will remain confidential. To ensure a respectful and productive conversation, we ask that we all follow a few simple ground rules: please speak one at a time, respect each other's views even when they differ from your own, and allow everyone an equal opportunity to participate.

To get us started, let's begin with a quick icebreaker. Please kindly introduce yourself by sharing your name, your age, and how long you have lived in this community.

SECTION A: Focus Group Demographic Summary Tracker

Age Range Tally: 60–69 Years [_____] | 70–79 Years [_____] | 80+ Years [_____]

Gender Tally: Male (M) [_____] | Female (F) [_____]

Marital status…….

Duration of Stay in Nyatsato: 20–30 Years [_____] | 30–40 Years [_____] | 40–50+ Years [_____]

Primary livelihood types ……

Level of education……

Village name…….

SECTION B: Perceived Causes of Climate Change Among the Elderly

1. What are the perceived causes of climate change according to this group?

_____

2. What specific changes in weather or climate patterns have you noticed over the years?

_____

3. How do you feel about these changes, and what do you think is responsible?

_____

4. What worries you most about climate change regarding the community's future?

_____

SECTION C: Challenges Faced by the Elderly due to Climate Change

1. What are the primary challenges of climate change adaptation that you face as an elderly group?

_____

2. How have these ongoing weather alterations impacted your daily routines or household lives?

_____

3. Can anyone share a recent specific experience with extreme weather conditions?

_____

4. Who steps in to support you during these difficult weather conditions, and what is the nature of that help?

_____

5. Are there elderly people in this community who receive no support at all? If yes, what are the primary reasons?

_____

SECTION D: Adaptation Strategies Utilized by the Elderly

1. In your view, what are the most effective broad coping strategies to counter or prevent the negative effects of climate change?

_____

2. What specific methods do you implement at the household level to cope with extreme weather constraints?

_____

3. Which of these strategies work best for the elderly, and why do you find them successful?

_____

4. Are there traditional or indigenous knowledge practices you employ to navigate these changes?

_____

Conclusion

Concluding Question: Is there anything else you feel we missed or that you would like to share about the experiences of older people regarding climate adaptation?

_____

Thank you all sincerely for your time, openness, and mutual respect during this focus group discussion. Your experiences are critical to this study.

End of Focus Group Discussion

Total Number of Participants: _____

Time Session Concluded: _____

Date of Session: _____

APPENDIX 3: Key Informant Interview Guide

Research Topic: The experiences of elderly people on climate change adaptation strategies. The case of Nyatsato ward 24 of Rushinga, Mt Darwin.

Location / Interviewer:

Nyatsato Ward 24, Rushinga | Interviewer: Rumbidzai Soda

Introduction & Informed Consent

Welcome. My name is Rumbidzai Soda and I am grateful for your presence today as we engage in this interview. Our goal is to hear and understand your experiences related to the experiences of elderly on climate change adaptation strategies. This is a safe space for you to share your stories, thoughts, and feelings.

Your insights are invaluable and will help us develop a deeper understanding of the challenges the elderly face and the support they need. Thank you for making a good decision to take part in this research. The information shared during this discussion will be kept strictly confidential.

To start our conversation, kindly share your responsibilities within the community or organization, how long have you worked with or served elderly populations, your age, and the nature of your interactions with older individuals.

SECTION A: Demographic Information

Age: _____

Gender: [ ] Male [ ] Female [ ] Other

Duration of Stay / Work in Nyatsato: _____ Years

Education level…….

Occupation / Role Type:

[ ] Agritex worker

[ ] EHT

[ ] Other: _____

SECTION B: Perceived Causes of Climate Change among the Elderly

1. What are the perceived causes of climate change in this community?

_____

2. What climate-related changes have you observed in this area over the years?

_____

3. In your view, how do these environmental changes affect elderly people specifically?

_____

SECTION C: Challenges of Climate Change Faced by the Elderly

1. Generally, what are the core climate change challenges faced by the elderly population?

_____

2. Based on your experience, how do elderly people experience or react during extreme climate-related events?

_____

3. Are current policies addressing the needs of elderly people in climate adaptation? If not, what needs to be changed?

_____

4. How do you see climate change affecting elderly populations here in the future?

_____

5. What priority actions or interventions should be moved forward by stakeholders?

_____

SECTION D: Adaptation Strategies being utilized by the elderly

1. What do you consider to be the most effective broad coping strategies to prevent the effects of climate change in this region?

_____

2. What specific strategies do elderly people use themselves to cope with climate variability or extreme weather?

_____

3. What support systems (institutional, external, or formal) are currently available to help elderly people adapt?

_____

4. What role do families and immediate communities play in supporting the elderly through these climate alterations?

_____

Conclusion

Concluding Question: Is there anything else you would like to add or emphasize regarding the experiences of older people and climate adaptation?

_____

Thank you for your valuable time and expert insights. Your voice will significantly contribute to this research.

End of Interview

Time Interview Concluded: _____

Date of Interview: _____

APPENDIX 4: University Research Letter



FACULTY OF SOCIAL SCIENCES AND HUMANITIES
DEPARTMENT OF SOCIAL WORK

P. Bag 1020
BINDURA, Zimbabwe
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BINDURA UNIVERSITY OF SCIENCE EDUCATION

TO WHOM IT MAY CONCERN

RE: REQUEST TO UNDERTAKE RESEARCH PROJECT IN YOUR ORGANISATION

This serves to introduce the bearer, SODA RUMBIDZAI, Student Registration Number B224294B, who is a HBSc Social Work student at Bindura University of Science Education and is carrying out a research project in your area/institution.

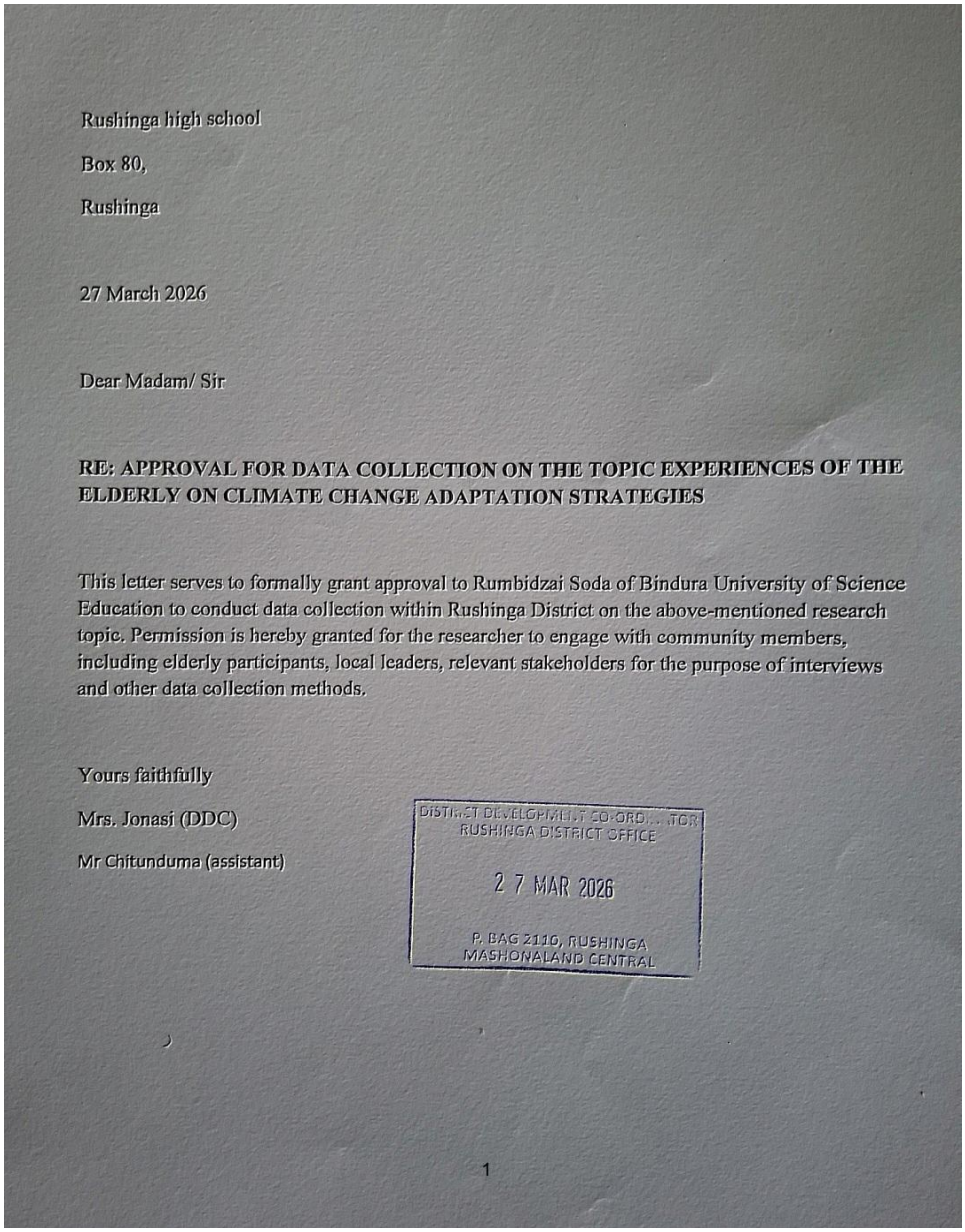
May you please assist the student in accessing data relevant to the study, and, where possible, conduct interviews as part of a data collection process.

Yours faithfully

Ms. E.E. CHIGONDO
CHAIRPERSON

BINDURA UNIVERSITY OF SCIENCE EDUCATION
DEPARTMENT OF SOCIAL WORK
CHAIRPERSON
16 MAR 2026
FACULTY OF SOCIAL SCIENCE & HUMANITIES
PRIVATE BAG 1020, BINDURA, ZIMBABWE

APPENDIX 5: Approval to Conduct Research



Rushinga high school

Box 80,

Rushinga

27 March 2026

Dear Madam/ Sir

RE: APPROVAL FOR DATA COLLECTION ON THE TOPIC EXPERIENCES OF THE ELDERLY ON CLIMATE CHANGE ADAPTATION STRATEGIES

This letter serves to formally grant approval to Rumbidzai Soda of Bindura University of Science Education to conduct data collection within Rushinga District on the above-mentioned research topic. Permission is hereby granted for the researcher to engage with community members, including elderly participants, local leaders, relevant stakeholders for the purpose of interviews and other data collection methods.

Yours faithfully

Mrs. Jonasi (DDC)

Mr Chitunduma (assistant)

DISTRICT DEVELOPMENT CO-ORD... TOR
RUSHINGA DISTRICT OFFICE
27 MAR 2026
P. BAG 2110, RUSHINGA
MASHONALAND CENTRAL

1