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FACULTY OF SCIENCE AND ENGINEERING

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**THE ROLE OF INDIGENOUS KNOWLEDGE AND CULTURAL BELIEFS
IN DISASTER RISK REDUCTION IN RURAL COMMUNITIES
(TSHOLOTSHO DISTRICT)**

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***A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF
REQUIREMENT OF BACHELOR OF SCIENCE HONORS DEGREE IN
DISASTER MANAGEMENT***

SUBMITTED: JUNE 2024

DECLARATION

To be complied by the student

Registration number B202016B

I Patience Myambo do hereby declare that this work is my original work and has not been submitted before. All the information derived from other sources is indicated in the project.

Signature of the student.....Date.....

To be complied by the supervisor

This dissertation is suitable for submission to the faculty and has been checked for conformity with the guidelines.

Signature of the
supervisor.....Date.....

DEDICATION

This research project is dedicated to my mother, may her soul rest in peace.

ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to my father for his unwavering support in all my studies. I would also like to extend my deepest gratitude to my aunt (my mother) for her love and guidance throughout this journey. Special thanks to my supervisor Mr. Samukange. He did a good good job patiently guide, encourage and correct me throughout the research project. Above all, I would like to thank the almighty God who continues to guide and protect us in our day to day activities.

ABSTRACT

Disaster risk reduction (DRR) efforts in rural communities of the global south (less developed economically and industrially) for example Zimbabwe fail to effectively engage with local indigenous knowledge and cultural beliefs. This case study examines the integration of indigenous knowledge and practices into disaster risk reduction (DRR) strategies in Tsholotsho district in Zimbabwe. The research utilized qualitative methods including interviews, focused group discussions and participant observation to explore how indigenous early warning systems, Resource management practices and spiritual eliefs shape community resilience to natural hazards.

The community members of Tsholotsho have developed sophisticated indigenous early warning systems that rely on observations of natural phenomena to predict the onset of drought, floods and other extreme weather conditions for example elders monitor the timing and intensity of the first rains, the flowering patterns of certain trees as well as the appearance of specific constellations in the night sky. These indicators provide advance notice of climatic conditions and allow communities to prepare accordingly such as adjusting planting schedules or relocating livestock.

Spiritual beliefs and cultural practices in Tsholotsho shape disaster preparedness and response. For instance rainmaking ceremonies are performed to summon rainfall during droughts. When floods occur some communities consult traditional healers to determine the appropriate ritual for cleansing and protecting affected households. These beliefs influence how people interpret early warning signs and make decisions about evacuation and relief efforts. They also inform indigenous coping strategies like the storage of grain in traditional granaries.

Despite the value of indigenous knowledge for disaster risk reduction (DRR), its formal incorporation into government policies and programs remains limited in Tsholotsho. There are tensions between customary and state-led approaches to emergency planning and natural resources management. Some officials view indigenous practices as outdated or unscientific preferring technocratic solutions. Reconciling these differing worldviews and power dynamics is crucial for developing holistic community based disaster risk reduction strategies (CBDRR).

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LIST OF ACRONYMS

DRR	-	Disaster Risk Reduction
UNISDR	-	United Nations Office for Disaster Risk Reduction
IK	-	Indigenous Knowledge
CB	-	Cultural Beliefs
DR	-	Disaster Risk
CBDRR	-	Community Based Disaster Risk Reduction
UNDP	-	United Nations Development Programme

1. CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Zimbabwe is prone to a variety of natural disasters such as floods, droughts, and earthquakes (Chikodzi and Nhundu, 2017). These disasters have significant impacts on rural communities, where people have limited resources to cope with disasters. Indigenous knowledge, which refers to the traditional knowledge and practices of indigenous communities, has been recognized as an important contribution to disaster risk reduction (DRR). Indigenous knowledge includes traditional methods of forecasting weather patterns, adapting to changing environments, and managing natural resources (Adger, 2003).

Studies have shown that indigenous knowledge can complement the scientific knowledge used in Disaster Risk Reduction and enhance the resilience of communities to natural disasters (UNISDR, 2017). In Zimbabwe, there is a growing recognition of the value of indigenous knowledge in DRR. For instance, the Zimbabwean government, in collaboration with UNICEF, has implemented a project in Mwenezi district that uses indigenous knowledge to improve Disaster Risk Reduction in local communities (Chikodzi and Nhundu, 2017).

Despite the importance of indigenous knowledge in DRR, there are challenges to its integration. One challenge is the lack of recognition and appreciation of indigenous knowledge by authorities and scientific institutions (Chikodzi and Nhundu, 2017). Another challenge is the erosion of indigenous knowledge due to globalization, urbanization, and modernization (UNISDR, 2017).

Overall, the contribution of indigenous knowledge to DRR in rural communities in Zimbabwe is significant. The role of indigenous knowledge and cultural beliefs in disaster risk reduction remains largely understudied and underappreciated. Hence, there is a need to address the challenges to its integration and to ensure its preservation for future generations. There this study endeavors to look at the role of indigenous knowledge and cultural beliefs in disaster risk reduction in rural communities in Zimbabwe, Tsholotsho.

1.2 Purpose of the Study

The purpose of this study is to gain a deeper understanding of the role of indigenous knowledge and cultural beliefs in disaster risk reduction in rural communities in Zimbabwe, with the goal of informing more effective policies and practices that are rooted in local knowledge and values.

1.3 Problem of the Study

Ideally rural communities in Zimbabwe should have access to effective disaster risk reduction policies and practices that are grounded in local knowledge and cultural beliefs. However, the reality is that this knowledge is often overlooked or marginalized, resulting in policies and practices that are not well-suited to the specific needs of rural communities. Despite the central role of indigenous knowledge and cultural beliefs in disaster risk reduction in rural communities in Zimbabwe, there is a lack of understanding of the specific mechanisms through which knowledge systems influence disaster risk reduction practices and policies. Without a clear understanding of these mechanisms, it is difficult to effectively integrate indigenous knowledge into disaster risk reduction. This can lead to poor disaster preparedness and inadequate responses to disasters, which can have severe consequences for the well-being of rural communities.

1.4 The Objectives of the Study

- a) To explore how indigenous knowledge of the natural environment has been used to reduce disaster risk in the rural communities.
- b) To examine how cultural beliefs influence disaster risk reduction practices and policies in the community.
- c) To assess the effectiveness of community-based approaches to disaster risk reduction in the rural communities.

1.5 Research Questions

- a) What is the role of indigenous knowledge in disaster risk reduction in rural communities in Zimbabwe, Tsholotsho?
- b) What cultural beliefs influence disaster risk reduction practices in rural communities in Zimbabwe, Tsholotsho?
- c) How can indigenous knowledge and cultural beliefs be better integrated into disaster risk reduction policies and practices?

- d) How does knowledge about the natural environment affect risk perception and response to disaster warnings?

1.6 Assumptions

One assumption of the study is that indigenous knowledge is a valid source of knowledge and can contribute to disaster risk reduction. Another assumption is that there are shared values and beliefs within the communities being studied, even if the specific practices may vary. Additionally, the study assumes that the research will be conducted in an ethical and culturally sensitive manner. Also, the communities being studied will be open to sharing their knowledge and perspectives with the researcher. The data collected will be representative of the communities being studied and the findings can be generalized to other similar communities. It also assumes that the findings will be communicated in an accessible and appropriate way to all stakeholders.

1.7 Significance of the Study

This study is important because it will contribute to our understanding of how indigenous knowledge and cultural beliefs can be used to reduce disaster risk in rural communities. By studying the unique characteristics of rural communities and the specific natural hazards they face, we can develop more effective policies and practices that are tailored to their needs. This will help to save lives and reduce damage caused by disasters in these communities. The study will fill a gap in the existing research by exploring the role of indigenous knowledge and cultural beliefs in disaster risk reduction. While previous research has explored disaster risk reduction in urban settings, there is a lack of understanding about how these approaches can be applied to rural communities. This study will fill this gap by exploring the role of indigenous knowledge and cultural beliefs in disaster risk reduction in rural communities. This will help to bridge the gap between theory and practice, and ultimately lead to more effective disaster risk reduction efforts in these communities. It will be useful for policy makers, disaster relief organizations, and rural communities themselves. This will show how the research will have practical benefits and real-world applications.

1.8 Delimitation of the Study

Delimitation are the factors that are outside of the researcher's control and could impact the results of the study. For example, a delimitation of the study could be the location and size of the rural communities studied. Another delimitation could be the specific natural disasters that have affected the communities, such as floods or droughts. Language barriers that may exist between the researcher and the participants. This could impact the ability to collect accurate data and interpret the results. It's important to acknowledge this delimitation in the study, so that the reader can understand the limitations of the results. Another important consideration is the researcher's own positionality. This includes factors such as the researcher's gender, age, race, and cultural background. The researcher's positionality can impact the way they interpret the data and how the participants respond to the questions.

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1.9 Limitations

The challenge of capturing and representing the complex and diverse forms of indigenous knowledge. Another limitation could be the difficulty of translating indigenous knowledge into policy recommendations that can be implemented at a larger scale. Additionally, the study may be limited by a lack of access to certain sources of indigenous knowledge, such as oral histories or traditional practices that are only shared within specific communities. Another limitation of the study could be the lack of standardization in the definitions and measurement of indigenous knowledge. This can make it difficult to compare and contrast different types of indigenous knowledge. Additionally, there may be ethical challenges associated with conducting research on indigenous knowledge, such as the risk of exploitation or appropriation of this knowledge.

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1.10 Definition of Terms

Indigenous knowledge refers to the understandings, beliefs, and practices that are specific to a particular culture or place (Grey, 2014).

Cultural beliefs refer to the shared values, norms, and beliefs of a particular group of people (Weller, 2005).

Disaster risk refers to the potential possible damage caused by a hazard due to the vulnerability within a community (Kotze, 1995).

Rural communities refer to communities that are located outside of urban areas and may have unique characteristics and needs (Sen, 1999).

2. CHAPTER TWO: LITERATURE REVIEW

This chapter examines on the role of indigenous knowledge and cultural beliefs in disaster risk reduction within rural communities in Zimbabwe specifically Tsholotsho district in Matebeleland North province, it explores how indigenous community's traditional knowledge, and cultural practices contribute to their resilience and adaptive capacity in the face of natural hazards. The review synthesizes key findings from range of scholarly articles, reports, and case studies to provide insights into valuable contributions of indigenous knowledge systems and cultural beliefs in disaster risk reduction efforts.

2.1.Introduction

Disasters are a growing threat to rural communities worldwide, with climate change exacerbating existing vulnerability. In this context, indigenous knowledge (IK) and cultural beliefs (CB) offer valuable resources for disaster risk reduction (DRR) strategies. This literature review explores the role of Indigenous Knowledge (IK) and cultural beliefs (CB) in DRR within the specific context of Tsholotsho, a rural district in Zimbabwe. It examines how these local systems contribute to understanding and mitigating disaster risk, with a focus on the following research questions:

1. **What is the role of indigenous knowledge in disaster risk reduction in rural communities in Zimbabwe, Tsholotsho?**
2. **What cultural beliefs influence disaster risk reduction practices in rural communities in Zimbabwe, Tsholotsho?**
3. **How can indigenous knowledge and cultural beliefs be better integrated into disaster risk reduction policies and practices?**
4. **How does knowledge about the natural environment affect risk perception and response to disaster warnings?**

Global Recognition of Indigenous Knowledge in DRR

The international community increasingly recognizes the value of IK in DRR. The Sendai Framework for Disaster Risk Reduction (2015) explicitly calls for the integration of indigenous knowledge (IK), traditional practices, and scientific knowledge for effective disaster risk reduction (DRR) strategies. Studies demonstrate the effectiveness of indigenous knowledge (IK) in various aspects of disaster risk reduction (DRR), including:

- **Prediction:** Indigenous Knowledge systems incorporate observations of natural phenomena like, Changes in animal behaviour (bird migration patterns, unusual insect activity), plant growth patterns (flowering times, wilting), Astronomical observations (star positions, cloud formations). These observations are used to predict floods, droughts, and other disasters (Nyong'a et al., 2007).
- **Prevention:** Traditional practices such as building settlements on higher ground or away from floodplain. Using specific building materials and designs (e.g., thatched roofs for wind resistance). Terracing on slopes to prevent soil erosion. These practices contribute to disaster risk reduction (Maferethane, 2013).
- **Mitigation:** Indigenous Knowledge offers insights into sustainable land management practices that prevent soil degradation and desertification. Traditional water harvesting techniques that improve water security and reduce drought vulnerability. Resource management practices that promote biodiversity and ecosystem health These practices can reduce disaster risk in the long run (Folke, 2006).

Regional Context: Indigenous Knowledge in Southern Africa

Research across Southern Africa highlights the significance of IK in DRR. Studies in Lesotho and Malawi document how communities use IK to predict weather patterns and prepare for droughts and floods (Nhemachena & Alexander, 2010; Eriksen et al). Similarly, studies in Malawi document how farmers use IK-based indicators like the flowering of specific trees to anticipate droughts (Eriksen et al., 2005). These studies emphasize the importance of acknowledging and integrating IK alongside scientific approaches for holistic DRR strategies.

Local Focus: Tsholotsho and its Indigenous Knowledge Systems

Limited research specifically explores Indigenous Knowledge systems in Tsholotsho, Zimbabwe. However, studies on neighboring regions and the broader Zimbabwean context offer valuable insights. For instance, research by Murungweni et al. (2013) in Matabeleland South, Zimbabwe, demonstrates how communities use Indigenous Knowledge-based weather forecasting to guide agricultural practices and prepare for droughts. This suggests the potential for similar practices in Tsholotsho, particularly regarding predicting floods based on river water levels and specific bird calls.

Cultural Beliefs and their Influence on DRR Practices

Cultural beliefs are interwoven with Indigenous Knowledge and significantly influence DRR practices. Beliefs about spirits, ancestors, and the natural world can motivate communities to take specific actions to appease deities or avoid misfortune (Agrawal, 2008). Studies by Shaw et al. (2009) in Kenya highlight how cultural beliefs about sacred groves can contribute to forest conservation, thereby reducing risks associated with landslides and floods. Cultural beliefs are interwoven with IK and significantly influence DRR practices. Beliefs about spirits, ancestors, and the natural world can motivate communities to take specific actions, such as appeasing deities through rituals and offerings to prevent natural disaster. Avoiding certain locations or activities believed to bring misfortune. Maintaining sacred groves or natural spaces considered to have spiritual significance, which can contribute to ecosystem conservation and reduce risks associated with landslides and floods (Shaw et al., 2009). Examining cultural beliefs in Tsholotsho can reveal their role in shaping local DRR practices, such as the potential role of ancestral veneration in motivating communities to take responsibility for environmental sustainability.

Integrating Indigenous Knowledge and Cultural Beliefs into DRR Policies and Practices

Despite growing recognition, integrating IK and CB into formal DRR policies remains a challenge. Studies by (Maferethane, 2013) point to a lack of documentation and communication around IK, hindering its effective utilization by policymakers. Additionally, scientific validation of some IK practices can be challenging. This highlights the need for collaborative approaches that bridge the gap between traditional knowledge holders and policymakers.

Knowledge of the Natural Environment and Risk Perception

A deep understanding of the local environment plays a crucial role in disaster risk perception and response. Communities with a strong knowledge base about historical weather patterns, animal behavior, and ecological indicators are better equipped to interpret warning signs and take appropriate action (Adger et al., 2005). Further research is needed to explore how knowledge of the natural environment shapes risk perception and response to disaster warnings in Tsholotsho.

Effectiveness of Community-Based DRR Approaches

Community-based DRR (CBDRR) approaches that empower local communities to manage disaster risk have shown promising results (Wisner et al., 2004). Studies by (Manyonga et al., 2013) in Zimbabwe demonstrate the effectiveness of community

based disaster risk reduction (CBDRR) programs that integrate Indigenous Knowledge and Cultural Beliefs into disaster preparedness, mitigation, and response strategies. Assessing the effectiveness of existing community based disaster risk reduction (CBDRR) programs in Tsholotsho can inform future interventions.

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2.2. Indigenous Knowledge Systems and Disaster Risk Reduction

Indigenous knowledge systems have long been a part of human existence, and they are significant because they have influenced how people interact with their surroundings. According to Dekens (2007), during the 1970s, there has been an increase in local knowledge and practices aimed at improving disaster risk reduction. As a result, this information became well-known and respected in the 1990s in the fields of climate change and disaster risk reduction (Hiwasaki, Luna, & Syamsidik 2014). The significance of indigenous knowledge in mitigating the risk of catastrophes and adjusting to climate change has been acknowledged, but it has not received much attention in disaster policy or science (Adger et al. 2011). There are still some catastrophe risk reduction practitioners who question its applicability and efficacy. Certain disaster risk reduction practitioners continue to question the applicability and efficacy of indigenous knowledge, viewing it as emotive, emotional, closed-off, and simplistic (Herbert 2000; Mitchel 1995).

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Its usefulness has been hampered by a lack of clarity over what indigenous knowledge actually is. The definition of indigenous knowledge is a subject of debate among academics (Fabiya & Olouko 2013). Local or traditional knowledge that comes from local communities is considered indigenous knowledge, according to Kelman et al. (2012). Agrawal (1995) characterizes indigenous knowledge as knowledge gleaned from environmental awareness communicated through dreams, visions, or intuition that is transmitted down the generations. As per Melchias (2001), indigenous knowledge pertains to the knowledge and customs of indigenous people, which they have accumulated over generations. These customs have developed via trial and error and have shown to be adaptable enough to manage change. A closer examination of these concepts indicates that indigenous knowledge is locally grown, passed down from one generation to another, and that years have passed since the knowledge was acquired. According to Chianese (2016), indigenous knowledge is the information and experience that has been gathered over many generations, tried and proven over

millennia, and used to inform how indigenous societies interact with their surroundings.

Communities have also relied on their indigenous knowledge for disaster management in an effort to lessen the effects of natural disasters. Native American wisdom has helped societies avoid various natural calamities that may have destroyed property and killed people. According to Meyers and Watson (2008) and Rungmanee and Cruz (2005), for example, indigenous knowledge had a crucial role in enabling communities to survive the 2004 Indian Ocean earthquake and tsunami. Local people have benefited from the widespread use of indigenous knowledge in certain circumstances, which has been utilized to enhance and supplement scientific understanding (Makhanu et al. 2007). Still, despite the expertise that indigenous people have to lessen the effects of flooding, disaster practitioners have not included it in the Tsholotsho case.

2.3.Cultural Beliefs Influence in Disaster Risk Reduction Practices and Policies

Cultural beliefs have a big impact on how communities perceive, behave, and react to natural hazards, which makes them important for disaster risk reduction (DRR). These ideas, which have a strong hold on societies' cultural fabric, influence how they perceive disasters, their causes, and the best ways to prepare for and react to them. A study by Bankoff, Frerks, and Hilhorst (2004) found that people's readiness to embrace particular disaster preparedness measures and their perceptions of risk are influenced by cultural ideas and practices. For example, in certain cultures, natural disasters like earthquakes and floods are ascribed to supernatural forces or divine wrath, which has an impact on how people understand and react to warnings or orders to evacuate. Nonetheless, effective community participation and resilience development need an awareness of and integration of cultural values into catastrophe risk reduction activities. Authorities can improve the efficacy of disaster planning and response operations by developing more inclusive and culturally sensitive tactics that are in line with local customs and values by recognizing and honoring cultural viewpoints (IFRC, 2014).

According to Wisner (2003), the lack of standard definitions for the words "disaster reduction" and "DRR" has caused a great deal of debate and misunderstanding among academics. According to Van Niekerk (2005), disaster risk reduction (DRR) is a more popular concept than disaster reduction because it places more emphasis on what is being reduced. This is because the term "disaster reduction" may lead to the misconception that disasters, rather than hazards and vulnerable conditions, are the main focus of risk reduction. DRR is described as "the conceptual framework of elements considered with possibilities to minimize vulnerabilities and disaster risk throughout a society" in the 2011 Department of Civil Protection (DCP) policy. Within the larger framework of sustainability, disaster risk reduction (DRR) removes or reduces the negative effects of risks. DRR are actions done in advance of a disaster, as Baumwoll (2008) notes. The intention is to lessen the potential effects of the disasters. Since the term "disaster risk management" exclusively pertains to preparedness and mitigation, she contends that it is more precise. The technological, social, and/or economic actions or policies taken to mitigate direct and indirect disaster losses are all part of this preventative approach to disaster risk (Mitchell and van Aalst, 2008). It is generally acknowledged that local or community settings are the best places for DRR to be implemented (Baumwoll, 2008).

Policies primarily specify DRR methods for rural populations (Manyena, 2013). Numerous international and national policy documents clearly state the procedures that must be used in order to comply with the policies (Wisner, 2008). The ways that policies are implemented in real life are what make them fascinating. This is particularly crucial since rural populations are increasingly experiencing the social, economic, and human effects of disasters, and their potential is being underutilized (Baumwoll, 2008). By incorporating IK into policies, the study hopes to facilitate the desired outcome, which is DRR. According to the UNISDR (2004), "Disasters are a result of the risk process." Risk is the possibility that a disaster would result in possible losses related to disaster risk in the context of vulnerability (UNDP, 2004). The complex relationships that bring about disaster risk link the likelihood of a trigger event (in the form of a disaster risk) with the susceptibility of a given community to disaster risk impact" (UNDP, 2002).

2.4.Challenges

The Tsholotsho district's communities have been hit by flooding-related calamities. Many of the district's settlements are located in low-lying areas, rendering them vulnerable to persistent floods even though the district is located in Zimbabwe's ecological region 5, which is typically a dry area with low rainfall levels. As a result, there have been fatalities and property damage from catastrophic flooding that the towns have previously suffered (Dube & Chiwanga 2014). The Zimbabwean government and its collaborating partners, which comprise non-governmental organizations, humanitarian organizations, and United Nations agencies, have been addressing the needs of victims of disasters by implementing contemporary intervention regimes that prioritize food aid while disregarding the expertise of the indigenous people in mitigation, preparedness, reaction, recovery, and preventative strategies. The Effectiveness of Community According to the writers, the lack of indigenous knowledge in Tsholotsho's flood management system makes flooding more common and worsens its consequences in places where human settlements are situated near low-lying areas and the Gwayi, Zombani, and Manzanyma rivers.

2.5.Based Approaches to Disaster Risk Reduction in the Rural Communities

Indigenous knowledge systems offer a plethora of options for how local communities, governments, scientists, and practitioners should respond to various crises. According to Mwaura (2008), indigenous knowledge can enable community members to assume leadership positions in initiatives meant to lower the risk of disaster. For example, mixed cropping is an example of indigenous knowledge that may be used to increase the output of different crops so that, in the event that other crops fail, there will still be food sources (Mwaura 2008). When a community has extensive indigenous knowledge of disaster risk reduction, it can manage itself and respond to disasters with the least amount of outside assistance. Before disaster risk reduction arrives, people can deal with a variety of risks and disasters using their indigenous knowledge.

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Mutasa (2015) asserts that indigenous knowledge plays a critical role in community development planning. This demonstrates how local communities can use indigenous knowledge as a tool for planning. With the use of this knowledge, disasters can be predicted along with their effects, allowing for the appropriate adoption of countermeasures. Nyong et al. (2007) go on to say that indigenous knowledge is a necessary component of developmental methods. Natural disasters have continued to have a serious negative impact on communities when indigenous knowledge is not extensively employed. Locals are well knowledgeable about their local environment and have a wealth of expertise with it. As a result, they have access to reliable information that can be used to support their communities' better preparedness and disaster management efforts, thereby lowering risk and impact. It is crucial that they participate in initiatives aimed at reducing the danger of disasters. People afflicted by disasters are not helpless victims, as has been noted (Sphere Project 2011); rather, they are citizens with valuable indigenous knowledge that practitioners can apply, as well as specific capacities.

The knowledge of indigenous peoples offers details and perspectives that support findings from traditional science and field research. A comprehensive comprehension of the environment, natural resources, and culture, as well as the interactions between humans and these elements, can also be obtained through it (Galloway McLean 2010, Nakashima et al. 2012, Tauli-Corpuz et al. 2009, Tebtebba Foundation 2009). Therefore, it would probably have a detrimental effect on the project's productivity and impact if indigenous groups were excluded from the planning stages of initiatives that affected their lives. Shaw et al. (2008) provide a summary of the significance of disaster risk reduction education. Native American knowledge systems of the surrounding areas and provide arguments for their inclusion in catastrophe risk reduction strategies. Indigenous knowledge holds great significance as it can be adapted and transferred to other communities facing similar circumstances; it also empowers communities to reduce their risk of disaster and encourages community participation; it can offer invaluable information about the local context; and its informal means of dissemination can serve as a model for disaster risk reduction education.

Indigenous knowledge has relevance outside of at-risk populations as well. Rather, it makes a priceless addition to the field of catastrophe risk reduction. Thus,

practitioners of disaster risk reduction, whose expertise tends to favor contemporary technology (Maferethane 2012), stand to gain a great deal from the traditional knowledge of local people. According to Mercer et al. (2010), practitioners typically undervalue the indigenous knowledge of local people since it is sometimes thought of as being less valuable than scientific information. Nonetheless, Kallard (2000) highlights the importance of indigenous knowledge to practitioners' work, contending that knowledge from indigenous sources is superior to that from Western research since it is validated in the context of survival. Therefore, it is useful in offering a means of survival in addition to being true or untrue in an unbiased manner. But in order for practitioners to fully benefit from indigenous knowledge, they must combine it with scientific information when addressing risks and disasters, allowing the two forms of knowledge to supplement one another. One example is the tsunami that occurred in the Indian Ocean; it is acknowledged that this event sparked interest in indigenous knowledge and how it may be integrated with science to reduce the danger of disaster (Mallapaty 2012). When the two types of information were combined in this way, their strengths were combined and disaster risk reduction efforts became more successful.

3. CHAPTER 3: RESEARCH METHODOLOGY

3.1.Introduction

This chapter provides an overview of the investigation location, tools, and procedures that will be utilized in Tsholotsho District, Wards 5 and 8, to investigate the role of indigenous knowledge and traditional beliefs to disaster risk reduction. The target population, sampling procedures, and study method are also covered in this chapter. Furthermore, this chapter provides an explanation of the research tools, research reliability, research validity, and research ethics.

3.2.Description of the Study Area

With an estimated population of 115 782, in Zimbabwe's Matabeleland North province (Zimstat 2022), Tsholotsho is among the seven districts. The districts of Bulilima, Lupane, Umguza, and Hwange are all bordered by the district. of Wards 5 (population estimated at 4,771) and 8 (population estimated at 9,344) of the districts (Zimstat, 2022), residences along the Gwayi, Zombani, and Manzanyma rivers, as well as low-lying areas, have frequently experienced flooding. Since some populations have settled and do business near rivers, these two wards are the most vulnerable to flooding in the district. Tsholotsho district is in the province of Matabeleland North on a map of Zimbabwe as shown in figure 3.2 below.

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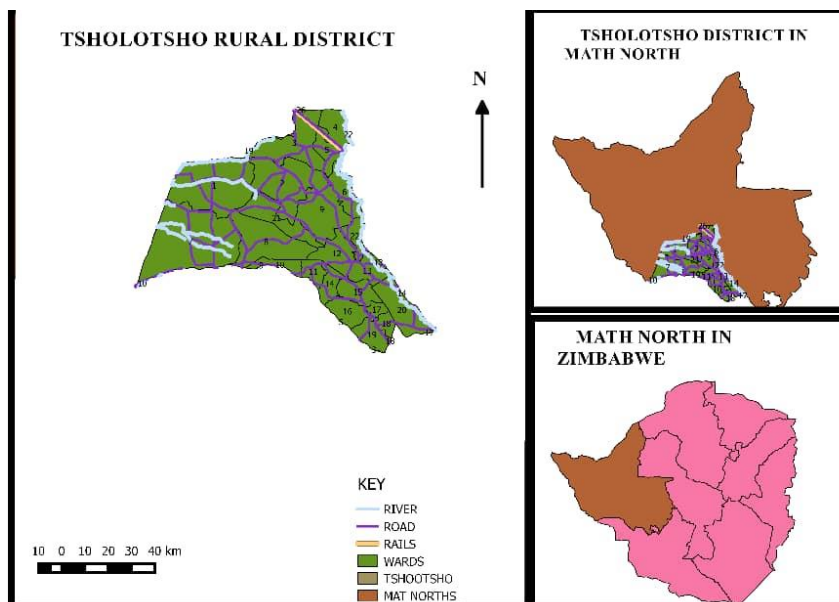


Figure 3.2 Map showing Tsholotsho District

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3.3. Study Design

The research utilized a qualitative methodology to investigate and comprehend the function of native knowledge and customs in mitigating the danger of disasters for human populations living in their natural environments. A thorough strategy incorporating qualitative methodologies is required to fully appreciate the role that indigenous knowledge and cultural beliefs play in reducing the risk of disaster. A cross-sectional study design was used in this investigation. An analysis of data from variables gathered at one point in time across a sample population or a predetermined subset of the population is called a cross-sectional study (Brandon, 2018). The data for this descriptive study were gathered through participant observation, interviews, and focused group discussions. Qualitative tools were then employed for analysis. Data was collected using a sample of thirty people.

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Where is the target population?

3.4. Data Sources

Throughout the study, the investigator employed both primary and secondary sources. Since primary data is information that researchers gather directly from primary sources through surveys, interviews, or experiments, the Tsholotsho people served as the primary sources for this research. Focused group discussions and semi-structured interviews were employed to collect the data. E-journals are one type of secondary data—information that has already been compiled from primary sources and made available for use by academics in their own work, such as literature reviews.

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3.5. Sampling Method

Owing to the substantial population in Tsholotsho district's wards 5 and 8, a purposive sampling technique was employed in the study. Purposive sampling is a non-probability sampling method in which investigators intentionally choose participants according to standards pertinent to the study issue or goals (Palinkas et al, 2015). Using this method, researchers can focus on people or groups that have the knowledge or expertise that is most useful for achieving their research objectives. In cases where the community of interest is small, specialized, or challenging to reach, purposeful sampling is very helpful. According to Higginbottom (2004), the most crucial tenet of purposive sampling is maximal variance, which directs researchers to recruit

participants who offer the greatest range of viewpoints feasible within the parameters set forth by their intended use. Utilizing purposeful sampling, data were gathered through interviews, focused group discussions and participant observations from 30 research participants.

3.6. Research Tools

As research instruments, the researcher employed semi-structured interviews, participant observation, and concentrated group discussions. Focused group talks are a popular qualitative method for exploring social topics in depth. Instead of using a statistically representative sample of the general population, the goal is to collect data from a specifically chosen group of people (Nyumba et al, 2018). According to Corbin and Strauss (2014), semi-structured interviews are in-depth discussions in which participants are required to react to pre-arranged, open-ended questions. The investigator waited calmly for the participants to complete the open-ended questions in the semi-structured interviews and attentively to their answers to the questions the investigator posed during a targeted group discussion.

The focused group discussion consisted of four questions:

- a) Traditional knowledge and practices done in Tsholotsho that is stories or traditions passed down through generations about natural disasters and signs from nature people use to predict potential disasters (animal behaviour, weather patterns)
- b) The effectiveness of the traditional practices in reducing disaster risk
- c) How can indigenous knowledge and cultural beliefs be better integrated into disaster risk reduction policies and practices?
- d) How does knowledge about the natural environment affect risk perception and response to disaster warnings as well as preserving traditional knowledge for future generations?

The researcher then went on and took the filled semi-structured interview questions for analysis.

3.7. Reliability and Validity of Research Instruments

According to Bajpai & Bajpai (2014), reliability and validity are psychometric qualities of measuring scales that are crucial for determining the suitability and accuracy of a scientific research's processes. Drost (2011) defines reliability as the

degree to which measurements may be repeated by various individuals on different occasions, in different conditions, and ostensibly using different devices that measure the same construct or skill. According to Nunnally (1978), reliability is the stability of a measurement under a range of circumstances in which the results are expected. The researcher examined the degree to which the findings agreed with accepted theories and other measurements of the same concept across time, by various observers, to determine validity and reliability.

3.8. Research Ethics

Research ethics encompass the moral dilemmas that emerge from or during research endeavors, in addition to the ethical behavior of researchers (Israel et al., 2013). The research participants didn't feel under any pressure to participate. Participants were informed by the researcher that declining to participate would not have any unfavorable effects. The researcher gave the volunteers every piece of information they required to understand the study, including its risks and advantages. The researcher safeguarded the personal information of all participants in accordance with their right to privacy. The researcher used all available methods to ensure confidentiality, even in situations where it was not possible for data collection to be done anonymously.

Where is the study limitation and research summary?

4. CHAPTER 4: RESULTS AND DISCUSSION

4.1.Introduction

This chapter delves into the qualitative findings from the research in Tsholotsho, Zimbabwe. It will explore how indigenous knowledge (IK) and cultural beliefs (CB) contribute to disaster risk reduction (DRR) practices within the community. The findings are discussed in relation to the research questions and contrasted with earlier study findings.

4.2.The Role of Indigenous Knowledge in Disaster Risk Reduction to Local Communities in Tsholotsho

In Tsholotsho district, the local communities benefited in multiple ways from the application of traditional knowledge systems to disaster assistance. Of the 30 respondents, 18 (or 60%) are community members who assert that traditional knowledge acts as a warning mechanism for impending and anticipated natural calamities like floods. Twenty percent of the thirty respondents, or six out of them, thought that indigenous knowledge may show how vulnerable a people are to calamities. Likewise, six out of thirty respondents (20%) thought that using indigenous knowledge could aid in determining what would be the best course of action to follow in case of an emergency. This implies that the local population have knowledge and vital life skills necessary for survival. Indigenous wisdom gives communities a system of early warning that enables preparedness and response to impending disasters.

Indigenous knowledge helps people react appropriately to the seriousness of the situation by indicating the level of vulnerability in the communities. According to the respondents, the communities, and low-lying areas in the Tsholotsho district that are closest to the Zumbani, Gwayi, and Manzanyma rivers are the most susceptible to floods. Because of this local knowledge, the communities have been able to plan for flooding in the district and take the appropriate safety measures, such as migrating.

The results validate a (2015) research by Mutasa that obtained that traditional knowledge was used by local inhabitants in Zimbabwe's Buhera and Chikomba districts to forecast the patterns of rainfall. Native wisdom also dictates the plan of action that local communities should take in the event of a natural calamity. To assist

kids in crossing, the investigation found that community members had built a makeshift bridge out of wooden poles. The results support research conducted in the Pacific by the Australian Red Cross (2010), which discovered that indigenous knowledge within communities might result in better, faster, and safer methods to handle emergencies, making use of the assistance provided by members of local communities.

Even though the indigenous knowledge of the communities where they live is extremely important, 80% of the respondents felt that the practitioners of disaster risk reduction undervalued their knowledge, and 20% were unsure of the practitioners' perception of their significance.

4.3. Cultural Beliefs Influencing Disaster Risk Reduction Practices in Local Communities of Tsholotsho

It was discovered that the Tsholotsho flood-affected community members possessed a significant degree of indigenous knowledge. With this knowledge, they were better able to recognize their vulnerability and make decisions regarding what to do before, during, and following floods. Communities rely on their indigenous knowledge to predict the amount of rain that will fall during the season and to respond to the flood disaster, according to interviews with community members and disaster risk practitioners.

The Tsholotsho district's traditional knowledge methods for anticipating and responding to floods, as discovered through interviews with respondents, are described below. The ensuing illustrates how awareness of the natural world influences one's sense of risk and reaction to alerts about impending disasters. the way some animal species behave and how some kinds of trees alter to determine whether the amount of rain that is about to fall will cause floods. According to the replies, the appearance of *amayezi amnyama*, or dark clouds, and the *inkanku's* (a bird that creates rain) constant cries and uneasiness are signs of impending, intense rain. The district may see floods because of these storms.

According to a 45-year-old male villager from Mahlosi line in the Siphepha area, "the possibility of floods due to heavy rains is known to be approaching during the rainy season, when we hear an unsatisfied inkankhu's unceasing cries." Then, in case it

starts to rain, we get ready to go to higher ground. There was another belief that the arrival of the rainy season was indicated by *ukuhluma kwezihlahla*, the sprouting of new tree leaves that heralds the start of a new season. The Tsholotsho district's traditional knowledge of disaster risk reduction for handling floods is outlined below:

Disaster Risk Reduction indigenous knowledge flood prediction

- **Available indigenous knowledge:** This refers to traditional methods passed down through generations to forecast rain.
- **Symbolism to local communities:** This explains what each observation means to the people.
- **Frequency:** This shows how often each method is used (out of a hypothetical sample of 30 observations).
- **Percent:** This indicates the percentage of the sample that relies on each method.

Key findings:

- **Dark clouds (*Amayezi amnyama*):** This is the most common indicator (50%) of heavy rain anticipated by the local community.
- **Rain-making bird (*Inkanku*):** The unsettled behavior of this bird is another significant sign (30%) for expecting heavy rain.
- **New leaves on trees (*Ukuhluma kwezihlahla*):** This is a less frequent (20%) indicator, but still holds meaning for some in the community, signifying the start of a new rainy season.

The aforementioned results are consistent with those of earlier research. A study conducted in Mizoram, northeast India, by Chinlapianga (2011) found that clouds that are heavy, dark, and oriented perpendicular to the sun's orbit portend impending rain. Floods can be forecast by the height at which birds build their nests from river surfaces, and the presence of particular bird species in trees is thought to indicate to the locals the start of the rainy season in Swaziland (Domfeh 2007).

Communities in Tsholotsho use the respondents' assessment of post-disaster indigenous knowledge measures based on the case study research, in addition developing pre-event risk mitigation strategies for anticipating overflowing. These measures incorporate land zoning (20; 50%), providing animals with shelters on higher ground (16:40%) and responding to flood events with locally accessible

resources (4: 10%). The process of land zoning comprises locating safe land in the neighborhood to which communities would be relocated in the case of floods. The respondents that mentioned land zoning stated that they would leave the "safer land" and go back to their former residences as soon as the floods stopped. Certain respondents stated that in locations prone to flooding, goats and cattle were housed on higher land to protect them from floodwater. They said that while humans who built shelters in low-lying regions killed during the storm, their livestock survived. According to the focused group discussion, the communities had constructed makeshift foot bridges, or *amazibuko*, across flooded rivers using wooden poles. These were specifically designed for kids who the villagers helped cross rivers so they could go to school.

Below summarizes the available flood response measures, their frequency of use out of 30 hypothetical observations, and the percentage representing their prevalence:

Key Findings:

- **Relocating to High Grounds:** This is the most frequent (50%) and seemingly the most common response measure among the three.
- **Land Zoning:** While used less frequently (30%) compared to relocating to high grounds, it's still a significant measure.
- **Local Available Resources:** This appears to be the least frequent (20%) response measure.

Points to Consider:

- **Land Zoning as a Proactive Measure:** Land zoning might be a long-term flood mitigation strategy rather than a direct response during a flood event. It likely involves restricting development in high-risk areas to minimize future flood damage.
- **Relocating to High Grounds as a Direct Response:** This is likely a more immediate response measure taken during a flood to ensure safety in Tsholotsho district.

Overall, the provided data suggests a combination of proactive measures (land zoning) and reactive measures (relocating to high grounds) are used to manage floods. Local

available resources are also incorporated, possibly for creating temporary barriers or using materials for evacuation purposes.

The research results support a study by Baumwoll (2008), which found that the field of catastrophe risk reduction benefits from the addition of indigenous knowledge. Jha and Jha (2011) came to the conclusion in another study on the Lepcha community in Sikkim, India, that a community's efforts to overcome the difficulties brought on by natural disasters can benefit from the utilization of indigenous knowledge.

4.4. Integrating Indigenous Knowledge and Cultural Beliefs into Disaster Risk Policies

According to the results of this study, 18 out of 30 (or 60%) respondents from the Tsholotsho community claimed that practitioners could effectively manage catastrophes if they combined their expertise with local understanding and used local information for preparation.

"Communities' indigenous knowledge is so important that if we disaster risk reduction practitioners can properly integrate it with our knowledge, we would be more effective in disaster response and recovery," stated one respondent, a 40-year-old male employee of the Civil Protection Unit in the Tsholotsho district.

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In addition, the participants expressed their belief that professionals might leverage local community expertise to enhance disaster response and community engagement. The respondents observed that practitioners of disaster risk reduction who are conversant with contemporary science do not always possess the knowledge of local populations; as a result, practitioners were deemed to be deficient in indigenous knowledge. They believed that combining the two forms of knowledge could be the answer to successfully reducing the danger of tragedy.

Fletcher et al. (2013) discovered in a study conducted in the South Pacific Region that the local communities had a strong desire to combine traditional knowledge with contemporary scientific methods. Barrios, Coutinho, and Medeiros (2012), who discovered that acquiring trans-disciplinary knowledge necessitates bridging numerous disciplinary boundaries and engaging scientific and non-scientific sources or activities, further encourage the integration of indigenous knowledge with practitioners' knowledge.

Six out of thirty (20%) of the respondents recounted how they believed that practitioners of disaster risk reduction may also use the traditional knowledge of nearby communities for planning purposes to foresee disasters. This suggests that practitioners can forecast and estimate the size of disasters using indigenous knowledge. For example, practitioners can foresee and plan for appropriate preventive, mitigation, and preparedness measures to be followed by looking at weather patterns and animal behaviour. Additionally, Chinlampanga (2011) suggested that local planning strategies for mitigation and adaptation actions might incorporate the knowledge of the local population about the weather and climate. As such, disaster risk reduction practitioners in Tsholotsho can immensely benefit from the indigenous knowledge of communities.

Practitioners of disaster risk reduction can gain from indigenous knowledge by increasing community involvement. "Community participation would be improved if indigenous knowledge of local communities was seriously considered by practitioners," stated one of the respondents, a 38-year-old male employee of the Civil Protection Unit. Communities would readily embrace ownership of development initiatives through their participation, increasing the projects' significance and sustainability for the local community. These results corroborate the claims made by Jha and Jha (2011) that indigenous knowledge is an invaluable national resource that may help with disaster preparedness, prevention, mitigation, and response in sustainable, affordable, and participatory ways.

The Ministry of Local Government Public Works and National Housing is tied to the Department of Civil Protection, which has the primary responsibility for disaster risk reduction initiatives in Zimbabwe. The National Civil Protection Coordination Committee provides further support to the Department of Civil Protection (Mavhura, 2015). The most well-known and one of the solutions created for DRR is the Civil Protection Act. Although it was first implemented in 1989, it has since undergone revisions. The Department of Civil Protection oversees it, and it is backed by the National Civil Protection Coordination Committee, which is made up of representatives from various organizations such as the Zimbabwe Red Cross Society, military commanders, and the secretary of health (Mavhura, 2015).

There are discussions over the possibility that this act's approach to disaster risk reduction (DRR) is insufficient. The Civil Protection Act acts as an early warning system, and resilience is highly valued in disaster risk reduction. It is argued that the concept of building resilience and reducing vulnerability through indigenous knowledge and cultural beliefs is not acknowledged (Kelman et al., 2017). Indigenous knowledge and cultural practices must be considered or integrated into national systems of prevention of disasters like cyclones that can lead to flooding, as Zimbabwe, for instance, still lacks a functional early warning system (UNESCO, 2019).

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5. CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

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5.1. Conclusion

Numerous significant results were drawn from the study. One significant finding is that efforts to reduce the risk of disasters benefit greatly from the indigenous knowledge of the surrounding communities. Additionally, the study discovered that communities have invaluable resources in the form of indigenous knowledge and cultural beliefs, which can enable them to manage a variety of risks and disasters. The report went on to say that to make disaster risk reduction interventions more successful, it is quite likely for practitioners of disaster risk reduction to combine contemporary scientific knowledge with traditional knowledge.

Disaster risk reduction practitioners lack indigenous knowledge, while communities lack access to contemporary scientific knowledge and technology. As a result, the study also discovered that if indigenous knowledge is considered while handling disaster situations, both community members and professionals working in disaster risk reduction can greatly benefit from it. As a result, local communities' indigenous knowledge is a vital empowerment resource that can be applied at every step of disaster risk reduction.

5.2. Recommendations

According to this study, local communities should think about using their indigenous knowledge in disaster risk reduction initiatives that encompass mitigation, readiness, response, and recovery as well as prevention. Among the study's recommendations is for practitioners of disaster risk reduction to think about combining their expertise with local populations' knowledge. Finally, to strengthen the recognition of indigenous knowledge held by local communities, the study suggests that it be included in the Civil Protection Act.

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Where are the appendices?