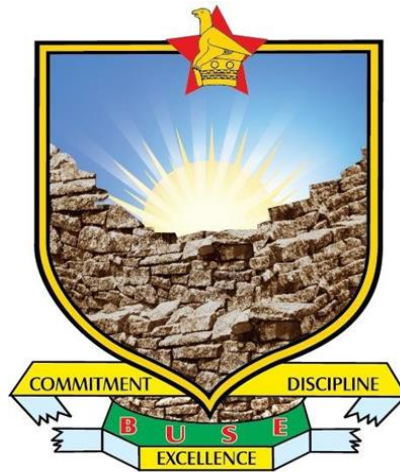


BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE AND ENGINEERING
SCHOOL OF GEOSCIENCES, DISASTER RISK REDUCTION AND
SUSTAINABLE DEVELOPMENT
DEPARTMENT OF DISASTER RISK REDUCTION



**Prospects of Integrating Indigenous Knowledge Systems in Managing Veld Fires in
Mazowe District**

BY

KUDZAIISHE MUBAIWA

B193352B

**SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
BACHELOR OF SCIENCE HONORS DEGREE IN DISASTER MANAGEMENT
STUDIES**

DECEMBER 2023

DECLARATION

I Kudzaishe Mubaiwa (B193352B), hereby affirm that this thesis is an output of my research and findings. The information outsourced from previous literature in this dissertation is fully acknowledged and a reference list is included. This work has not been previously submitted in part or entirety for any degree purposes to any other university.

Signature

.....
Date

APPROVAL

The undersigned approves that this research was supervised and was approved for final submission to the Department of Disaster Risk Reduction.

.....
Supervisor

.....
Date

DEDICATION

This thesis is dedicated to my mother Everjoy Mubaiwa who is ever sacrificing for me to achieve my dreams. She was my strength throughout this journey. I also dedicate it to my beloved husband Blessed Moyo who sacrificed his precious time and accompanied me to go into the field to collect data without considering the distance. Last but not least my angel late Naomie Moyo who has always been my pillar of strength hoping that one day she will enjoy the fruits of my project.

ACKNOWLEDGEMENTS

My utmost gratitude is directed to God almighty, for the strength and good health to carry out this demanding research project to completion. I would want as well to express my appreciation to my research supervisor Dr Maponga, from the bottommost part of my heart. This project would have been aborted without your patience and consistence in encouraging as well as guiding me. I am also highly indebted to Mr M Gomo and for technical assistance whenever I got stuck during the process. I thank you from a solemn heart. To ambuya Mubaiwa, thank you for the encouragement and push to continue working on this project until accomplishment. My friends you cannot be thanked enough. You always believe in my dreams.

ABSTRACT

Several compelling arguments support the integration of indigenous knowledge systems (IKS) and scientific knowledge in fire management. Integration is required for the adaptation of scientific information and technologies, such as Early Warning Systems (EWS), to local conditions. This study therefore, focused on the integration of indigenous knowledge systems (IKS) in veld fire management in Ward 13 of Mazowe District. A descriptive study design was used together with mixed methods approaches to gather qualitative and quantitative data on the IKS practices for veld fire management in Mazowe, extent of IKS integration in veld fire management as well as effectiveness of integrating IKS and scientific knowledge in veld fire management in Mazowe District. Data were collected from a sample of 35 participants were drawn from the villagers through purposive sampling methods. Controlled burning, the use of fire beaters, the establishment of firebreaks, the planting of fire-resistant hedges/trees, regulation through traditional leadership, oral education and awareness, and the use of sand to put out fires are all commonly mentioned IKS practices. Although it was established that the extent of IKS integration is still poor, the study on the other hand evaluated that IKS is very important in veld fire management. It was recommended that IKS should be incorporated in policies for veld fire management in Zimbabwe.

LIST OF TABLES

Table 4.1: Effectiveness of integrating IKS and Scientific Knowledge on veld fire management in Mazowe District	30
---	----

LIST OF FIGURES

Figure 3.1: Location of the study area	16
Figure 4.1: Different IKS practices related to fire management in Mazowe.....	24
Figure 4.2: The extent of IKS integration in veld fire management in Mazowe District	27
Figure 4.3: Availability of policies and regulations for promoting IKS integration in fire management	29

TABLE OF CONTENTS

DECLARATION	i
APPROVAL	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
LIST OF TABLES	vi
LIST OF FIGURES	vii
ACRONYMS	xi
CHAPTER ONE	1
INTRODUCTION	1
1.1 Introduction	1
1.2 Background to the study	1
1.3 Problem statement	3
1.4 Aim of the study	4
1.5 Research Objectives	4
1.6 Research Question	4
1.7 Significance of the study	4
1.8 Scope of the study	5
1.9 Definition of terms	5
1.9.1 Indigenous Knowledge Systems	5
1.9.2 Veld fire	6
1.10 Conclusion	6
CHAPTER TWO	7

LITERATURE REVIEW	7
2.1 Introduction	7
2.2 Theoretical framework	7
2.2.1 Traditional Ecological Knowledge	7
2.2. Cultural Ecology.....	9
2.2.3 Community Based Natural Resources Management	10
2.3 Indigenous Knowledge systems linked to veld fire management	11
2.4 Effectiveness of IKS in veld fire management.....	12
2.5 Conclusion.....	14
CHAPTER THREE	15
RESEARCH METHODOLOGY.....	15
3.1 Introduction	15
3.2 Description of the study area.....	15
3.3 Research Design.....	16
3.4 Research approach.....	17
3.5 Target population	18
3.6 Sample size.....	19
3.7 Sampling method.....	19
3.8 Data collection methods	20
3.8.1 Questionnaires	20
3.8.2 Key informants' interviews	21
3.9 Data analysis methods.....	21
3.10 Ethical considerations	22
3.10.1 Informed consent	22
3.10.2 Anonymity and confidentiality	22
3.11 Conclusion.....	22
CHAPTER FOUR.....	24
DATA ANALYSIS, PRESENTATION AND DISCUSSION	24
4.1 Introduction	24
4.2 Indigenous knowledge systems in veld fire management in Mazowe District.....	24

4.3 Extent of IKS integration in veld fire management in ward 20 of Mazowe District	27
4.4 Effectiveness of Integrating IKS and Scientific Knowledge on Veld Fire Management in Mazowe District.....	30
4.5 Chapter conclusion	33
CHAPTER FIVE	34
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	34
5.1 Introduction	34
5.2 Summary of key findings	34
5.3 Conclusion.....	35
5.4 Recommendations	36
REFERENCES	37
APPENDIX 1	40
QUESTIONNAIRE FOR PARTICIPANTS IN MAZOWE DISTRICT	40
APPENDIX TWO: INTERVIEW GUIDE FOR KEY INFORMANTS	45

ACRONYMS

IKS	INDIGENOUS KNOWLEDGE SYSTEMS
IK	INDIGENOUS KNOWLEDGE
CBNRM	COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT
EMA	ENVIRONMENTAL MANAGEMENT AGENCY
SDGs	SUSTAINABLE DEVELOPMENT GOALS
DRR	DISASTER RISK REDUCTION
SFA	SENDAI FRAMEWORK FOR ACTION
CE	CULTURAL ECOLOGY
TEK	TRADITIONAL ECOLOGICAL KNOWLEDGE
EWS	EARLY WARNING SYSTEMS

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Indigenous knowledge systems (IKS) has, during the revolution of modern ways of managing disasters, been taken for granted. Veld fires also referred to as wild land fires are a critical global environmental and socioeconomic cause of concern, with significant havoc in many communities despite the world having instituted various methods of regulating and controlling this menace. This section of the study presents the background, problem statement, research objectives, research questions, justification, as well as scope together with the definitions of the key terms.

1.2 Background to the study

Local knowledge is distinguished from scientific knowledge, according to experts. When investigating this divide, scientific knowledge is frequently viewed as a formal agreed-upon technique or curriculum (Gaillard and Mercer 2012; Mercer 2012). This understanding of the local knowledge systems is presumed to be useful in veld fire management practices through its indispensable role in making predictions. The native and intrinsic ways of making predictions based on the collection of knowledge by people who live in close ties with the natural environment and are associated with local culture and long-term settlement in communities are then referred to as local knowledge (Codjoe et al. 2014; Derbile et al. 2016; Muita et al. 2016). Local knowledge is also known by other titles, many of which have similar connotations (Iloka 2016), such as Indigenous Knowledge (IK), Traditional Knowledge (TK), Traditional Ecological Knowledge (TEK), and Indigenous Technical Knowledge (ITK). In the perspective of disaster risk reduction, the meaning of IKS is based on the experience of local people in relation to disasters and risks surrounding them.

Several compelling arguments support the integration of indigenous knowledge systems (IKS) and scientific knowledge in fire management. Integration is required for the adaptation of scientific information and technologies, such as Early Warning Systems (EWS), to local conditions (Mawere, 2014). Local contexts, including ecological, social, and cultural factors, can have a significant impact on the efficacy and acceptability of scientific approaches.

Scientific information and technologies can be tailored and customized to meet the specific needs and conditions of the community by incorporating IKS, which is deeply rooted in local knowledge and practices, thereby increasing their relevance and effectiveness. Several arguments support the case for integration: needed to adapt scientific information and various technologies (for example, EWS) to local circumstances (Walshe and Nunn 2012), a vehicle for improving community capacity (Tran et al. 2009), and as a method of ‘banking’ on the strengths of both local and scientific knowledge; as Mercer (2012) argues, the limits of one knowledge system can be addressed by the strengths of the other, and vice versa.

Veld fires have been a major problem in Zimbabwe and Sub-Saharan Africa, killing hundreds of people and destroying property and the environment (EMA, 2023). Veld fires have been one of the most overlooked and misunderstood, but they are a major contributor to climate change. Veld fires, also known as forest fires, grass fires, or bush fires, are uncontrollable, rapidly spreading fires that commonly occur in wild land areas. Veld fires can occur naturally, but many veld fire outbreaks are caused by careless and reckless human behaviour. As reported by EMA (2023), in 2022, a total of 7 511 fire incidents were recorded during the dry season, which destroyed 1 753 055 hectares of forest and grassland, compared to 3 948 fire incidents recorded in 2021, subsequently destroying 1 033 722.86ha. These statistics also cover parts of the current study area.

According to Dube and Munsaka (2018), proponents of indigenous knowledge systems, such as disaster risk reduction scholars, have frequently contested that indigenous knowledge of local communities can significantly contribute to saving human lives and property from the negative consequences of disasters (Hiwasaki, Luna, and Syamsidik 2014). This can be important in Mazowe District which is hugely characterised with Savana Grasslands making the area prone to veld fire-related disasters. Local knowledge from the grassroots level, according to researchers, should not be overlooked by authorities since it may help communities prevent, mitigate, prepare for, and recover from disasters (Jones 2012). Local people have particular skills that have evolved over generations, and these capacities and knowledge have been evaluated and demonstrated to be durable and useful in both catastrophe reduction and risk management. There is a potential of integrating these rich knowledge systems into scientific fire management practices towards serving communities.

The Sendai Framework for Disaster Risk Reduction 2015-2030, agreed by the Third United Nations World Conference, supports for the use of indigenous peoples' knowledge and

traditions to supplement scientific understanding in disaster risk assessment, according to the UNISDR (2015). The framework recognizes that indigenous peoples contribute significantly to the creation and execution of plans and systems, including early warning, via their experience and traditional knowledge (UNISDR 2015). As a result, indigenous knowledge is an important part of catastrophic risk mitigation. However, there is no evidence on the ground as to the effectiveness of integrating IK in fire risk management within communities.

Bringing the concept closer home, Mutasa (2015) directed that indigenous knowledge is critical in community development planning especially towards managing risks. This demonstrates that indigenous knowledge may be exploited by local populations as a planning tool. Use of IKS for veld fire management can be imminent in Mazowe area which is cultural and characterised by strong social networks. Such knowledge may be used to forecast the incidence and effect of disasters, allowing appropriate responses to be implemented. Nevertheless, there is silence on how this concept can be applied in managing veld fires. Another knowledge gap exists from the fact that the Indigenous knowledge proponents, including academics, have differing perspectives on the elements that lead to a lack of confidence and conviction in community indigenous knowledge (Mawere 2010). Therefore, this study intends to explore and document the prospects of mixing IK and scientific knowledge in wild fire management in Mazowe community.

1.3 Problem statement

For centuries, indigenous knowledge systems (IKS) have played an important role in fire management in Zimbabwe. To effectively manage and control fires in their respective ecosystems, the country's broad indigenous communities have established complex knowledge, practices, and techniques. There have been various scientific methods and approaches to deal with veld fires yet they remain a scourge in Zimbabwe and around the globe. It is evident that there is less consideration of IKS for veld fire management and control in Mazowe District. This gap is evident even in numerous Zimbabwean communities, which are known to possess rich traditional knowledge. Scholars like Mutasa (2015) have highlighted the importance of IK in disaster risk reduction (DRR), but Dube and Munsaka (2018) note a lack of consensus among scholars regarding the value of IK in risk management. Additionally, opponents of indigenous knowledge argue that it is not universally accessible across generational classes, is context-specific, and lacks scientific

validation (Matsui, 2015). In light of these debates, this study aims to examine the potential for integrating IK and scientific knowledge in the management of veld fires in the Mazowe District, taking into account the local context and perspectives.

1.4 Aim of the study

The purpose of this study is to explore the prospects of integrating indigenous knowledge systems in managing veld fires

1.5 Research Objectives

- i. To determine indigenous knowledge systems linked to veld fire management in Mazowe District.
- ii. To assess the extent of IKS integration in veld fire management in Mazowe
- iii. To examine the effectiveness of integrating IKS and scientific knowledge in veld fire management in Mazowe District.

1.6 Research Question

- i. Which indigenous knowledge systems are linked to veld fire management in the Mazowe District?
- ii. What is extent of IKS integration in veld fire management in Mazowe District?
- iii. How effective is integrating IKS and scientific knowledge in veld fire management in Mazowe District?

1.7 Significance of the study

This project intends to solve veld fire control concerns in a comprehensive and culturally appropriate manner by merging indigenous knowledge systems with scientific knowledge. This research is significant for a number of reasons. For starters, it respects and honours indigenous knowledge systems, cultivating cultural appreciation and encouraging local community participation in fire management. Second, it allows for the evaluation of the efficacy of traditional methods and approaches in veld fire management, so contributing to the validation and documentation of indigenous knowledge. Third, the project intends to improve the efficiency and sustainability of veld fire management tactics in the Mazowe

District by investigating the combination of indigenous knowledge systems and scientific knowledge.

This research aims to inform policy and practice, foster collaboration among various stakeholders, and contribute to the development of context-specific and culturally sensitive methods to veld fire management by bridging the gap between indigenous knowledge and scientific knowledge. The study's findings have the potential to benefit local populations, ecosystems, and the general well-being of the Mazowe District. Villagers in Mazowe District will thus benefit from this study through enhanced knowledge on the significance of integrating IKS in veld fire management. Effective veld fire control has immediate consequences for community well-being and environmental resilience. This research aims to improve community resilience, reduce fire-related risks, and protect biodiversity and ecosystem services by integrating indigenous knowledge systems, which frequently prioritize community involvement and ecological balance, with scientific knowledge, which provides technical expertise and evidence-based approaches.

1.8 Scope of the study

The study will concentrate on Zimbabwe's Mazowe District, ward 13. The community will be the focus of the temporal scope from 2019 to 2023. This specific geographic location was chosen to investigate the local context, which includes indigenous populations, ecosystems, and fire management strategies common in the region. The research will investigate and document indigenous knowledge systems associated with veld fire control in the Mazowe District. Traditional fire control tactics, cultural beliefs, ecological wisdom, and other local knowledge and practices passed down through generations are all examples of these IKSs. Conceptually, the study encompasses a holistic understanding of the environment, including traditional ecological knowledge and sustainable resource management strategies.

1.9 Definition of terms

1.9.1 Indigenous Knowledge Systems

Indigenous knowledge is defined as knowledge which is spatially and/or culturally context specific, collective, holistic, and adaptive (Varghese and Crawford, 2021). Indigenous knowledge as given by Bruchac (2014) is an interconnected system of knowledge, beliefs,

and traditions that are intended to preserve, communicate, and contextualize indigenous relationships with their culture and landscape over time. According to Kugara and Mokgoatšana (2022), Indigenous knowledge systems are the distinct knowledge, practices, beliefs, and values established and passed down through generations by indigenous communities. These systems are deeply ingrained in local cultures, environments, and traditions. Agriculture, medicine, ecology, astronomy, navigation, storytelling, and spiritual practices are all examples of indigenous knowledge. It is frequently holistic, interconnected, and intimately connected to the land, community, and spiritual beliefs. Indigenous knowledge systems are distinguished by a thorough understanding of the local environment, practices of sustainable resource management, and a harmonious connection between humans and nature. In this study, IKS will be understood as the local and non-scientific knowledge that is built within Mazowe community over decades.

1.9.2 Veld fire

A veld fire is an uncontrolled wildfire that takes place in open grasslands, arid regions, or different vegetation types a hallmark of the African veld ecosystem (Mutasa, 2015). It is a wildfire that burnt across the landscape and is usually fuelled by dry grasses and other flammable vegetation. In this study, veld fire is viewed as any form of fire that is not controlled that happens in the grassland areas of Mazowe district.

1.10 Conclusion

This current chapter raised a number of issues towards the subject, integrating IKS in veld fire management. Chief among them is that IKS has a significant impact on effective veld fire management and control. This can be focused to case of Mazowe District which has numerous veld fire cases. The chapter also established that although IKS is gaining popularity, there is still limited literature on its role in fire management. The main issues established emphasize the existing gap on the potential of integrating IKS in veld fire management practices, specifically in Mazowe and Zimbabwe. The next chapter will look at literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This review of the literature examines the existing research and literature on the prospects of integrating Indigenous Knowledge Systems in veld fire management. The major issues to be discussed in this chapter involves the theoretical framework which encompasses three models which were considered useful in explaining the study objectives and intentions as well as conceptual and empirical literature on study objectives. The synthesis of existing literature will assist in identifying knowledge gaps, highlighting successful examples of incorporating IKS in fire management, and informing the development of a conceptual framework.

2.2 Theoretical framework

To explain and understand the research topic, several theories were employed. These theories include, theory of Traditional Ecological Knowledge (TEK), Cultural Ecology (CE) and Community Based Natural Resources Management (CBNRM).

2.2.1 Traditional Ecological Knowledge

Traditional Ecological Knowledge (TEK) theory provides useful knowledge into the possibilities of integrating Indigenous Knowledge Systems (IKS) in veld fire management in the Mazowe District. TEK emphasizes indigenous communities' deep understanding and accumulated wisdom about their local ecosystems (Berkes, 2018). Over generations, indigenous communities have developed intricate knowledge systems for observing and interacting with their environments in environmentally sound ways. This knowledge encompasses the role of fire in ecosystem dynamics, patterns of fire behavior, and traditional fire management practices. TEK recognizes the interconnectedness of ecological systems in the context of veld fire management and emphasizes the importance of incorporating IKS into contemporary approaches. Indigenous communities possess an in-depth comprehension of the interactions between fire, vegetation, soil, wildlife, and water supply systems (Copes-Gerbitz, et al, 2021). Their expertise can help to improve fire prevention, early warning systems, and adaptive management strategies. Fire management efforts can be aligned with

local ecological processes and cultural values by incorporating IKS, resulting in more sustainable and context-specific outcomes.

TEK includes a thorough understanding of the local ecosystems as well as the interactions between humans and the natural environment. It is passed down from generation to generation through oral tradition, cultural practices, and the cultivation of traditional foods. However, the preservation of TEK is currently threatened due to the extinction of indigenous languages, which impedes the transmission and comprehension of this valuable knowledge (Montag *et al*, 2014). The TEK conceptual framework emerged in the 1980s, primarily promoted by tribal elders, to improve recognition and appreciation of indigenous communities' interdependence with the natural world. It provides insights into sustainable resource management and environmental health by acting as a bridge between indigenous perspectives and Western scientific knowledge.

TEK is gaining popularity among a variety of sectors, including non-Native scientists, public municipalities, and government agencies. It is acknowledged as an important knowledge system that supplements environmental health sciences. A more comprehensive and holistic understanding of ecological systems can be achieved by incorporating TEK (Finn *et al*, 2017). The integration of TEK and Western scientific knowledge has the potential to contribute to more effective and long-term resource management approaches. Indigenous communities have unique perspectives on local ecosystems, including fire management practices, plant and animal species, and ecological processes (Jessen *et al*, 2022). Non-Native scientists and agencies can gain a better understanding of the local context and develop more culturally appropriate and environmentally sound strategies by incorporating TEK.

Fire management approaches that incorporate TEK can incorporate traditional practices like selective burning techniques, which promote biodiversity, regenerate vegetation, and minimize the risk of uncontrolled wildfires. The use of sustainable fire management practices derived from TEK can help to preserve ecosystems and the Mazowe District's long-term resilience. The incorporation of TEK in veld fire management helps to preserve and revitalize indigenous knowledge systems. There is an opportunity to support the transmission of traditional knowledge, cultural practices, and languages by recognizing the value of TEK and involving indigenous communities. This comprehensive approach benefits the overall well-being and cultural resilience of the Mazowe District's indigenous communities.

2.2. Cultural Ecology

The theory of Cultural Ecology investigates the dynamic relationship between human societies and their environments. It emphasizes the mutual influences of culture and the natural environment, such as how cultural practices, such as fire management, shape and are shaped by ecological processes. Understanding the Mazowe District's cultural ecology can provide insights into the cultural significance of fire and the potential for incorporating IKS in fire management (Cochrane, 2019). The study of human adaptations to social and physical environments is known as cultural ecology (Frake, 1962). Human adaptation is defined as the biological and cultural processes that allow a population to survive and reproduce in a given or changing environment (Joralemon, 2010).

According to Frake (1962), cultural ecology is the study of how human societies adapt to their social and physical environments. This multidisciplinary field investigates the reciprocal relationship between culture and nature, recognizing that human adaptation involves both biological and cultural mechanisms. Cultural ecology philosophy offers a framework for comprehension of how indigenous communities have adapted their cultural practices for successful interaction with their environment, including fire management, in the context of fire management in the Mazowe District. Adaptation includes both biological and cultural factors that allow populations to survive and thrive in their environment. Cultural adaptations, on the other hand, refer to the knowledge, practices, and technologies that a society develops in order to successfully navigate their environment (Hill et al, 2020). Cultural adaptations in fire management include the establishment of traditional knowledge systems, fire management practices, and the passing down of this knowledge across generations.

Understanding the Mazowe District's cultural ecology allows researchers to investigate how cultural practices, such as fire management, have shaped and been shaped by the local environment. It delves into the specific ways in which indigenous communities have adapted their practices to manage fire effectively within their ecological context. Fire management strategies that integrate Indigenous Knowledge Systems (IKS) and align with the cultural values and practices of local communities can be developed by recognizing the reciprocal influences between culture and the natural environment. This implies that, applying CBNRM in fire management practices through active appreciation of IKS in Mazowe District can create a link between cultural practices and knowledge as well as the call for protecting the environment hence, effective fire management practices.

2.2.3 Community Based Natural Resources Management

The theory of Community-Based Natural Resource Management centres on the participation of local people in the management of natural resources. CBNRM identifies the significance of community participation, empowerment, and decision-making in achieving sustainable resource management outcomes. Applying this theory to fire management can simplify the integration of IKS by involving indigenous communities in decision-making processes and recognizing their traditional practices (Nyoni et al., 2020).

Community-based management (CBM) is an approach that emphasizes local stakeholder participation in various aspects of planning, research, development, management, and policy-making processes within a community (Balint & Mashinya, 2005). It is typically facilitated by an upper-level government or non-governmental organization (NGO) structure but aims to empower local people to address the specific social, political, and ecological challenges they face and find solutions that suit their unique situation. CBM allows for the decentralization of decision-making and management tactics, enabling communities to have more control over their resources and development. The effectiveness and long-term application of CBM can be influenced by external factors such as national or local economic, political, and social pressures. These external pressures can impact the efficiency and sustainability of CBM initiatives. However, when implemented properly, CBM has been found to be highly beneficial for both the environment and the well-being of the stakeholders involved (Reid, et al, 2020).

CBM has been associated with improved environmental health, as local stakeholders have a vested interest in sustainable resource use and conservation. Additionally, CBM has demonstrated positive social and economic impacts, such as increased community empowerment, enhanced livelihoods, and improved social cohesion (Berkes, 2009). By involving local communities in decision-making processes, CBM fosters a sense of ownership and responsibility, leading to more sustainable and equitable outcomes. It recognizes the importance of local knowledge, cultural values, and community participation, which can contribute to the long-term success and resilience of environmental and social initiatives.

2.3 Indigenous Knowledge systems linked to veld fire management

Indigenous peoples all over the world have developed traditional fire management practices that are deeply ingrained in their ecological knowledge systems. To maintain landscapes in a sustainable manner, these practices include controlled burning, precise timing, and careful consideration of fire frequency (Bowman et al., 2011). Indigenous communities in Australia, for example, have long used fire as a tool for land management. They burn specific areas strategically during specific seasons to achieve desired ecological outcomes. These practices aim to reduce fuel loads, promote plant growth, and develop a mix of kinds of vegetation to maintain diverse habitats (Bowman et al., 2011; Russell-Smith et al., 2009).

Indigenous communities' accumulated ecological knowledge guides their decisions on when, where, and how to implement controlled burns. This knowledge is passed down through generations, ensuring that their fire management practices remain consistent (Pyne, 1997). Indigenous North American cultures, such as Native American tribes, have long recognized the role of fire in maintaining healthy ecosystems. They use prescribed fires to regenerate native plant species, improve forage resources, and manage hunting and gathering habitats (Kimmerer, 2002). Indigenous fire management practices are frequently informed by a thorough understanding of local ecosystems, such as fire behaviour, fire effects on vegetation and wildlife, and the complex relationships between fire and other ecological processes (Berkes, 2012). This understanding enables Indigenous communities to use fire as a landscape management tool, shaping ecological dynamics in ways that benefit their livelihoods and promote biodiversity (Cochrane, 2003).

There is increasing understanding of the ecological advantages and cultural significance of Indigenous fire knowledge systems by incorporating traditional fire management practices into modern land management approaches. Collaboration between Indigenous communities and Western scientists aims to bridge the gap between Indigenous knowledge and scientific approaches, resulting in more effective and context-specific fire management strategies (Russell-Smith et al., 2009). These initiatives emphasize the significance of acknowledging and respecting Indigenous knowledge systems as valuable contributions to sustainable land management and conservation efforts.

Many indigenous communities have designated fire guardians responsible for implementing and maintaining traditional fire management practices. These individuals hold specialized knowledge and play crucial roles in preserving fire-related cultural practices and ecological

balance (Anderson & Morishima, 2005). The role of fire guardians extends beyond simply implementing controlled burns. They hold a deep understanding of their local ecosystems, including the ecological processes influenced by fire, such as vegetation dynamics, wildlife habitat, and soil fertility (Berkes, 2012). This specialized knowledge allows fire guardians to make informed decisions about when and where to conduct controlled burns, ensuring that these practices align with their cultural traditions and ecological goals.

Fire guardians are also responsible for passing down traditional fire management knowledge to future generations. They ensure the continuity of indigenous fire practices and the transmission of ecological knowledge from one generation to the next through mentorship, apprenticeship, and direct participation (Huntington, 2000). This intergenerational knowledge transfer is critical for the long-term preservation of indigenous fire management practices and the cultural values and beliefs that go with them. The designation of fire guardians not only helps to maintain ecological balance, but it also strengthens indigenous communities' cultural identity and resilience. Many indigenous cultures around the world associate fire with their spirituality, traditional practices, and cultural heritage (Pyne, 1997). By entrusting fire guardians with the responsibility of preserving and practicing traditional fire management, these communities can ensure the continuation of their cultural traditions and strengthen their connections to the land.

2.4 Effectiveness of IKS in veld fire management

The importance of IKS in veld fire management cannot fall very far from the effectiveness of IKS in Disaster Risk Reduction given that veld fires are a prominent catastrophe in grassland communities. Since the 1980s, there has been a growing interest in traditional knowledge, indicating a need to learn more about indigenous and/or local resource-use practices from an ecological standpoint. The Sustainable Development Goals (SDGs) of the United Nations and the Sendai Framework of Action (SFA) 2015-2030 have both focused on holistic approaches to indigenous disaster risk reduction (DRR) techniques in recent years (Lambert & Mark-Shadbolt, 2021). However, it is still unclear how indigenous knowledge complements and contributes to veld fire risk reduction.

Combating Indigenous people's socioeconomic inequities caused by colonial and neo-colonial practices, as well as utilizing their sociocultural-environmental worldviews, knowledge, and practices in DRR to reduce risk and facilitate resilience, are central to this

goal. To achieve this goal, however, critical qualitative and indigenous research must be used to gain a holistic understanding of the historical and contemporary complexities of indigenous worldviews, knowledge, and practices that influence Indigenous peoples' DRR interpretations, behaviours, and actions (Ali, et al 2022).

The launching of programs and reports that include the Global Fire Initiative and "Living with Fire—Sustaining Ecosystems & Livelihoods through Integrated Fire Management" reflects a growing understanding of the significance of integrating traditional and scientific knowledge in fire management (Lambert & Mark-Shadbolt, 2021). The report identifies a significant gap in government and urban society understanding and recognition of the role of rural societies in fire management. Instead of viewing rural communities as the source of fires, the report contends that they should be viewed as part of the solution. It emphasizes the importance of policies and programs that recognize and support rural communities' traditional knowledge and practices regarding fire use (Vazquez-Varela, et al., 2022). More effective and sustainable fire management strategies can be developed by combining traditional knowledge and practices with the application of scientific research and technology.

Indigenous people in Zimbabwe play an important role in the conservation of forests and grasslands within communal areas; thus, their local knowledge is critical in the management of veld fires, which pose a threat to forests and grasslands. These indigenous people utilize their local knowledge to develop conservation strategies that have helped these natural resources thrive (Mawere, 2014). Making investments in Indigenous Knowledge (IK) for fire prevention and management can help to ensure that forest resources continue to provide various goods and services in a sustainable manner. Traditional approaches to conservation employed by local leaders often differ from conventional strategies used by forest and wildlife management authorities.

Conventional methods, such as fencing protected areas or imposing fines on people who start fires, can lead to conflicts between local communities and management authorities, predominantly when the livelihoods of the locals depend on forest goods and services (Nizam et al., 2019). In contrast, the IK approach, based on the traditional knowledge of local communities, can help avoid such conflicts and reduce the need for extensive state resources to enforce protective laws for wildlife and forest resources. People can develop a sense of ownership towards fire management strategies and procedures when knowledge of local people is respected.

One of the challenges associated with IK is its gradual loss over time. Since traditional knowledge is often communicated through oral stories, legends, myths, and songs, there is a risk of its erosion as societies modernize and shift away from traditional practices (Mavhura et al., 2013). This loss of IK can have adverse effects on sustainable resource management and conservation efforts. To address this issue, efforts can be made to document and preserve traditional knowledge systems. This can involve recording oral histories, documenting traditional practices, and engaging with local communities to gather and compile their knowledge. By recognizing and valuing the importance of IK in sustainable resource management, steps can be taken to ensure its transmission to future generations and its integration into contemporary conservation practices.

Nevertheless, a number of studies inclined towards IKS impact on ecological management in communities failed to critically establish the role that is played by local knowledge in dealing with veld fires. There is need to research on the potential of integrating IKS in conventional fire management practices. This study therefore, intends to close in that gap through a research on the prospects of integrating IKS into fire management practices.

2.5 Conclusion

The literature review section explored various literature pieces which explain the importance of integrating IKS into fire management practices. The chapter established that indigenous people including those in Zimbabwe play an important role in the conservation of forests and grasslands within communal areas; accordingly, their local knowledge is critical in the management of veld fires, which pose a threat to forests and grasslands. Nevertheless, the chapter also unveiled that there is still deficiency of literature to support the significance of IKS in veld fire management. This necessitates the need for further research. The next chapter explains the methodology.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The main focus of this section is to give an outline of the processes and procedures used to collect and analyse data related to the objectives. The aim is to come up with a research methodology that best explore the integration of IKS into veld fire management practices. Thus, the study design, study approach, target population, sampling procedures, data collection and analysis methods among other important issues are presented in this chapter. Descriptive survey research design, mixed methods approach as well as purposive sampling techniques were some of the central methodologies highlighted in this chapter.

3.2 Description of the study area

This study was conducted in Mazowe district which is located in Mashonaland Central province. The district borders Harare Metropolitan, Bindura District, Mt Darwin and Guruve Districts (See figure 3.1). The area is characterised with fertile soils and conducive rainfall patterns which promote the growth of grass across the entire unused land. People in this District mainly rely on farming, including tobacco, wheat and maize farming. These commercial farming activities necessitates the clearing of land as well as possibilities of veld fires during the fire season.

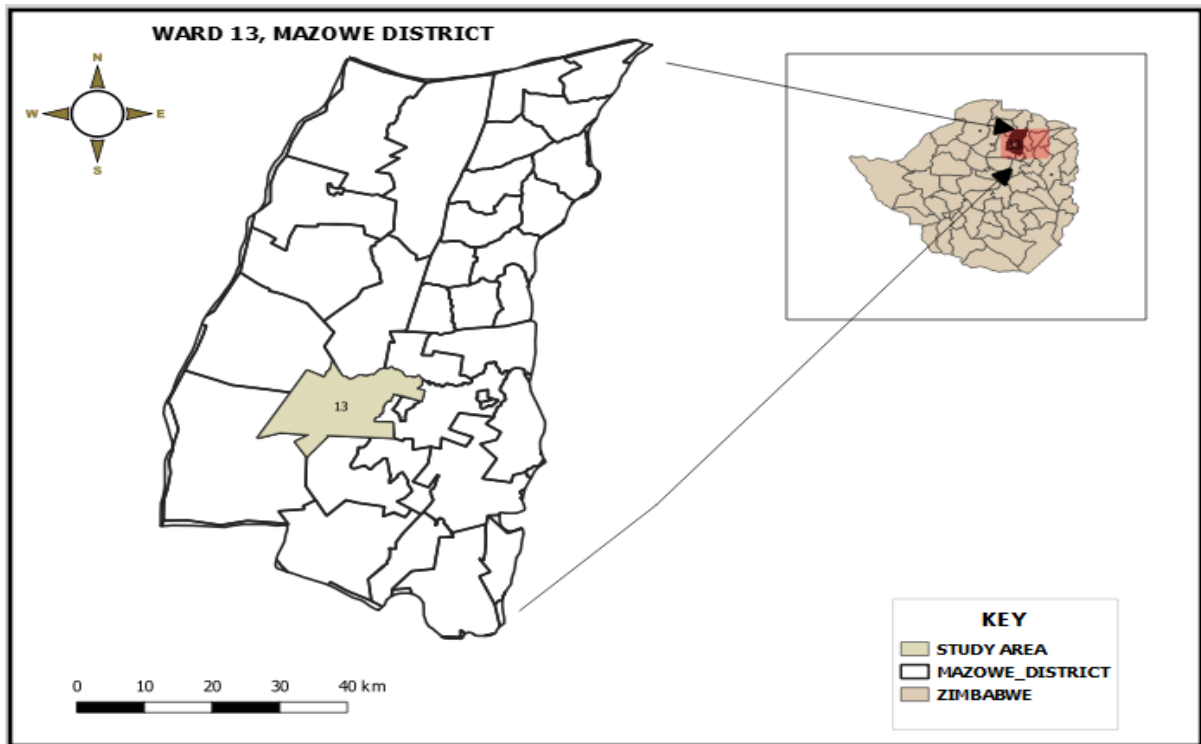


Figure 3.1: Location of the study area

3.3 Research Design

This study adopted a descriptive survey research design to plan and organize the data collection and analysis processes on integrating IKS in fire management practices in Mazowe District. The design tolerates lessons from both qualitative and quantitative data as well as using cost-effective methods of gathering data like questionnaires. Calderon (2006), described descriptive research as a purposive method of collecting, analysing, classifying, and tabulating data about prevailing conditions, practices, processes, trends, and cause-effect interactions and then making passable and accurate interpretation about such data with or without or sometimes minimal aid of statistical methods.

The decision to adopt a descriptive survey research design for this study, focusing on integrating Indigenous Knowledge Systems (IKS) in fire management practices in the Mazowe District, was justified based on several factors. Firstly, the descriptive design allowed the researchers to systematically collect, analyze, and interpret data about the prevailing conditions, practices, and processes related to fire management and IKS in the study area. This design provided a comprehensive snapshot of the current state of affairs, facilitating a detailed understanding of the topic.

Studies investigating community perceptions and practices related to environmental conservation are examples of studies that have used the descriptive survey research design. Smith et al. (2019), for example, used a descriptive survey approach to look into local knowledge, attitudes, and behavior regarding wildlife conservation in a rural community. The researchers collected data on members of the community's perceptions, practices, and factors determining their conservation behaviours through questionnaires and interviews. The study gained insights into the current conditions and trends in wildlife conservation in the specific community by using this approach.

Another example is a study conducted by Johnson and Jones (2018), which used a descriptive survey design to investigate the use of traditional medicine in a specific population. The researchers used structured questionnaires to collect information about current practices, trends, and perceptions of traditional medicine use. The descriptive design enabled them to classify and analyse the data, providing valuable insights into the population's utilization and perceptions of traditional medicine. Similar to the justification for its use in this study, the descriptive survey research design was chosen in both of these examples to systematically collect and analyse data about current conditions, practices, and trends.

Similarly, this technique ascertains prevailing circumstances of facts in Mazowe District that gives either qualitative or quantitative, or both, descriptions of the general characteristics of the group as results. This was considered useful, particularly on understanding the potential opportunities for conjoining IKS into veld fire management processes. Descriptive research involves direct exploration, analysis and description of the particular phenomena, as free as possible from unexplained presuppositions, aiming at maximum intuitive presentation (Hurlburt & Akhter, 2006).

3.4 Research approach

This research considered mixed methods approach, where both qualitative and quantitative research methods were applied in the study to evaluate the impact of IKS in different fire management practices within Mazowe District. In mixed methods approaches, researcher tends to base knowledge claims on realistic grounds, for example, consequence-oriented, problem-centred and pluralistic (Creswell, 2003:18). For several reasons, the decision to use a mixed methods approach in this study, combining both qualitative and quantitative research methods, was justified. The study intended to give a more detailed and strong evaluation of

the effect of Indigenous Knowledge Systems (IKS) on fire management practices in the Mazowe District by integrating qualitative and quantitative methods. The researchers were able to capture both the subjective experiences, perspectives, and conclusions of the community members (qualitative) and the numerical information and statistical analysis (quantitative) using this approach.

The study was able to generate an improved comprehension of the intricate and multifaceted nature of the partnership between IKS and fire management by utilizing multiple methods.. “It employs tactics of inquiry that include gathering data either simultaneously or sequentially to best understand research problems” (Creswell, 2003:18). The data collection process also includes gathering both numeric information (for example, on instruments) and text information (for instance, on interviews) so that the final database represents both quantitative and qualitative information (Creswell, 2003:20). For this research, the major focus was on exploring the problem not on proving the effectiveness of the procedures.

This method was considered beneficial to this study because it offered a rational ground, operational flexibility (Maxwell, 2016) and an in-depth understanding on the practices and ways of living for Mazowe District people which builds their rich indigenous knowledge base. Moreover, the use of mixed-methods allows researchers to answer study questions with sufficient depth and breadth (Enosh, Tzafir, & Stolovy, 2014) and supports generalisation of findings and implications of the studied issues to the whole population.

3.5 Target population

This study targeted villagers in ward 13 of Mazowe District, particularly looking at the aging population which was considered richer in traditional knowledge compared to the young age groups. ZIMSTAT (2022) Population and Housing Census, the study area has a total of 7566 people and 1921 households. *The* study also targeted Environmental Management Agency (EMA) officials who were considered knowledgeable on issues related to veld fire management and cases within the study area. The study guaranteed an extensive range of viewpoints and expertise by targeting both the aging population with traditional knowledge and EMA officials, optimizing the chances of getting an all-encompassing and diverse knowledge about veld fire management in the Mazowe District.

McMillan and Schumacher (2010) designated the target population as “a group of elements or cases, whether individuals, objects, or events, that conform to specific criteria and to which the research intend to generalize the results of the study.” The target population is also defined as the collective group, with similar characteristics, that a researcher would like to generalize the results of the study to (Roberts, 2010). Springer (2010) directed that a study population is a collection of people that a study is carried out on and anticipates to examine it. The study population is defined as a group of people or entities, assumed to possess the same line of belief that mollifies the interests of the researcher (Khan *et al.*, 2013).

3.6 Sample size

The sample size of the study was calculated to represent the total study population in the targeted area. The researcher failed to acquire data on the total number of elderly people in the wards hence, the study was based on an estimated sample of 35 participants from villagers drawn from different households and 5 key informants from EMA. From the opinion of the scholar, the sample was viewed as representative of the people in ward 13 with the ageing and knowledgeable population being given priority. Creswell (2012) says that sample is a subdivision of the target population that the researcher plans to study for generalizing about the target population. The sample should be a representative of the total population under study.

“A well-defined sample has the same characteristics as the population as a whole, and therefore, when a research is conducted on such sample, the results obtained will represent the characteristics of the whole population” (Sreejesh *et al.*, 2013, p. 19).

3.7 Sampling method

The study used purposive sampling method to select only those participants with indigenous knowledge of the fire management processes Mazowe District. Purposive sampling was important as it helped in ensuring that the participants picked were informed and avoiding the selection of people without enough IKS knowledge. Purposive sampling (also known as judgment, selective or subjective sampling) is a sampling technique in which researcher relies on his or her own judgment when choosing members of population to participate in the study. According to Saunders, Lewis & Thornhill (2012), purposive sampling is a non-probability sampling method and it happens when “elements selected for the sample are

chosen by the judgment of the researcher. Researchers often believe that they can obtain a representative sample by using a sound judgment, which will result in saving time and money”

3.8 Data collection methods

Questionnaires and key informants’ interviews were used to gather data on the integration of IKS towards fire management processes in Mazowe District ward 13.

3.8.1 Questionnaires

The study used questionnaires as the main data collection tool. The study designed a simple questionnaire with both open and closed questions to gather in-depth data from the study participants. For several reasons, the decision to use questionnaires as the primary data collection tool in this study was justified. For initial reasons, questionnaires offer a structured and standardized approach that ensures consistency in the information gathered (Creswell & Creswell, 2018). Second, they provide participants with flexibility and convenience by allowing them to respond at their leisure (Creswell & Creswell, 2018). This feature is especially useful when dealing with an extensive sample size or widely distributed participants. Furthermore, questionnaires are less expensive than other methods such as interviews or focus groups (Creswell & Creswell, 2018). The secrecy of questionnaires encourages honest and impartial responses, allowing participants to freely express their views (Creswell & Creswell, 2018). The use of both open-ended and closed-ended questions aided in the collection of qualitative and quantitative data, increasing the breadth of the insights obtained.

Creswell and Creswell (2018) described a questionnaire as an accumulation of questions which have been prearranged to query a number of questions and collect answers from respondents relating to the study topic. In such, the questionnaire for this study asked questions which directly spoke to the objectives. The major benefit for adopting a questionnaire is that it would allow respondents to respond to study questions during their free time. Questionnaires were considered to be a rapid and effective approach to gather data from participants in Mazowe over a short amount of time. In summary, the use of questionnaires provided a dependable, efficient, cost-effective, and inclusive method for gathering in-depth data from a diverse range of Mazowe District participants.

3.8.2 Key informants' interviews

Data from the EMA officials were collected through planned interviews. Research interview is the verbal conversation between two people with the objective of collecting relevant information for the purpose of research (Coffman, 2002). The drive of key informant interviews is to gather evidence from a wide range of people—comprising community leaders, professionals, or residents—who have primary knowledge about the community. The major advantage for using interviews was that, the study could probe into the psychological and emotional perspectives of interviewees who were assumed to be experienced on the veld fire management issues in Mazowe. Cresswell (2018) emphasised that interviews are an important tool of gathering qualitative data, especially when targeting to understand the group dynamics of people.

3.9 Data analysis methods

Since this study adopted a mixed methods approach, the analysis procedures also incline towards fulfilling both qualitative and quantitative methods. Quantitative data will be analysed using descriptive statistics to give mean, frequencies and proportions. This data will be presented using tables, charts and graphs. The process of data analysis involves reducing the volume of raw information selecting significance from nonsense, identifying significant patterns and constructing a framework for communicating the essence of what the data reveal. Since interviews produce a large volume of data in non-standardized format, this research will identify the categories and connections of perceptions that came from the respondents (Saunders, et al 2016). This will be done by way of coding and categorising data. Coding data, includes breaking the data down into components for analysis and then classifying the units.

This research will use data that will be transcribed from interviews. Data will be characterized according to major themes. Under each main theme, several groups shall be developed and analysed using the content analysis or thematic approach ((Braun & Clarke, 2019). This will involve reading the transcripts in their entirety several times and trying to get a sense of the interviews before breaking them into parts. From there the researcher will have to develop a meaningful story so as to determine the outcome the study will draw out of the gathered data.

3.10 Ethical considerations

Research ethics are a set of principles of morality, particularly those dealing with right or wrong of an action. Ethics in research refer to rules of conduct for members of a particular profession and a science of the study of human behaviour (Campbell & Pretti, 2017). The study will take high cognisance of important research ethics.

3.10.1 Informed consent

The researcher ensured that participants were fully aware of the purpose of research and how it is supposed to be conducted. The keystone of ethical research is ‘informed consent’ (Denzin & Lincoln, 2011). During the research on the prospects of integrating IKS and scientific knowledge in veld fire management, informed consent was found to be important since it is an ethical standard that assured that research participants had the necessary information to make a rational choice about their involvement in the study. The term comprises of two significant elements, with each needful of vigilant consideration, that is, ‘informed’ and ‘consent’. According to Campbell & Pretti (2017), the level of attention on ethical conduct (the activities that are personal, professional, and during research activity) has both increased and broadened in response to society’s expectation of greater answerability

3.10.2 Anonymity and confidentiality

The study also strictly observed anonymity and confidentiality. Participant anonymity and participant confidentiality are two terms normally used synonymously when in fact they are dissimilar (Flemming & Zegwaard, 2018). Participant anonymity entails that the participant’s identity are anonymous to the scholar (for example, when using anonymous surveys, the participant identity is truly unknown to the researchers). Participant confidentiality entails that the participant’s identity are known to the researcher but the data was de-identified and the identity is kept confidential (for example, interviews, where the participant identities are known to the researcher, therefore, only confidentiality, not anonymity, can be offered).

3.11 Conclusion

This section focused on the research methodology. The study adopted a descriptive research design as well as a mixed methods approach to look into the objectives towards assessing the integration of IKS in veld fire management. The methods used for gathering and analysing of

data in this study were designed to provide a comprehensive examination of the integration of IKS into veld fire management practices in Mazowe District. The combination of quantitative and qualitative approaches enabled a comprehensive understanding of the topic, capturing both quantitative data and rich qualitative insights. Study population and sample were also outlined as well as the use of the purposive sampling procedure. The next chapter will be on analysis and presentation of data.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter examines the effectiveness of integrating Indigenous Knowledge Systems (IKS) and scientific knowledge in veld fire management in the Mazowe District through data analysis, presentation, and discussion. The information gathered from key informants and participants provides crucial information into indigenous knowledge systems related to veld fire management, the level of integration of IKS in current practices, and the overall effectiveness of combining IKS and scientific knowledge. Graphs and tables were used for quantitative data while direct quotes were used for qualitative data.

4.2 Indigenous knowledge systems in veld fire management in Mazowe District

The study assesses the IKS in veld fire management in Mazowe District. It was found out that IKS has several practices which can be used in veld fire management in the district. Figure 4.1 shows the summary of results from questionnaires.

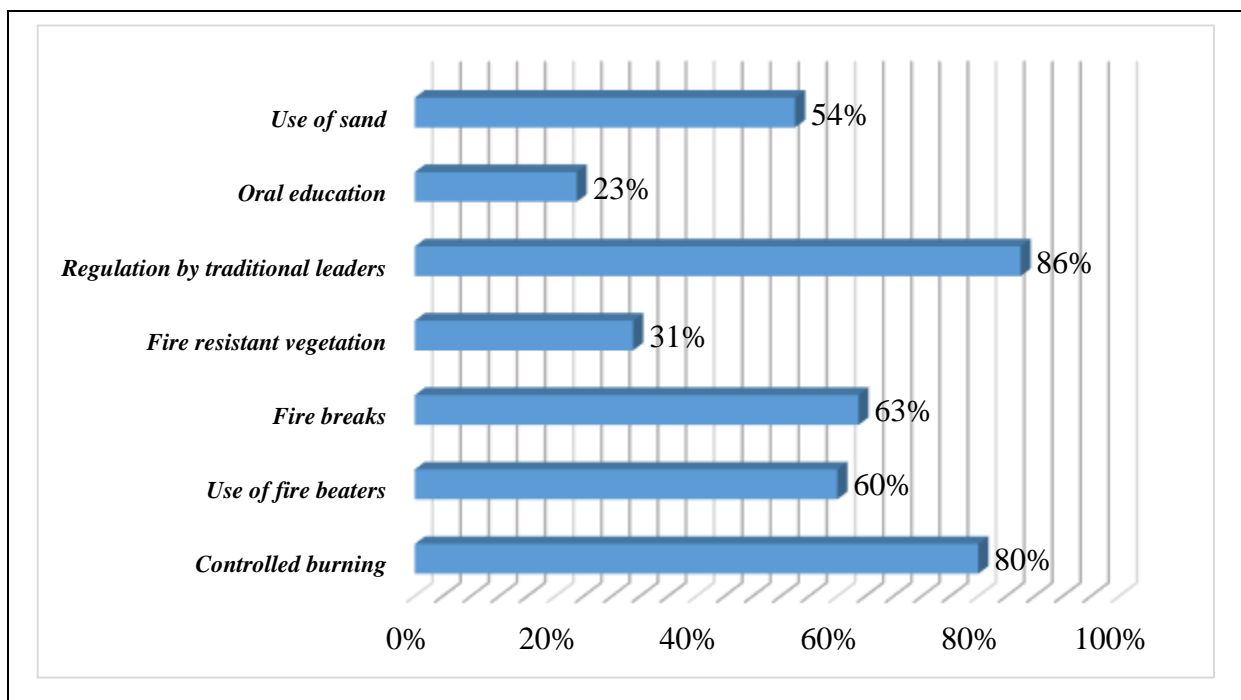


Figure 4.1: Different IKS practices related to fire management in Mazowe.

The findings in figure 4.1 showed that the people in ward 13 acknowledge some traditional knowledge-based activities and practices which are useful towards veld fire management. One of the participant also added that;

“As people in this society which is strongly rooted in culture, there are certain places which are naturally safe from people who start veld fires because they are seen as sacred. In Mazowe District, mountains and some rivers are cultural places hence, people always aim to protect those areas. Although this is now loosing value, the recognition of taboos and cultural restrictions can be viewed as positive towards veld fire management...” (Participant)

This means, people in the community themselves see some of their cultural practices as valid practices towards reducing and controlling veld fires. It is difficult however, to be fully aware of the actual value of these cultural practices in managing veld fires since it is only found from unwritten education.

Besides the cultural practices, several people who participated also showed that using IKS they control spread of veld fires by using firebreaks as well as beating fire using certain tree branches. One of the participants said;

“We have known it since our past that firebreaks are useful in cases of veld fires, fire cannot cross where there is bare soil. Therefore, we could remove grass right round our houses or farms. You can see around here and everywhere that yards are cleared and we leave them bare so that our huts are safe from veld fires, among other threats like snakes and so on. We also use green tree branches to beat fire before it spreads to other areas....” (Participant)

A key informant also shared a similar statement on this objective;

“Local people in Mazowe District like in any other districts across the country have their shared cultural and day-to-day practices. Among these, some contribute to best fire management practices. As EMA, sometimes we are called to respond to fire incidences during fire seasons but when we reach there we see people in local communities already putting off the fire using, sand, and water as well as tree branches from their trusted trees....” (Key informant)

A second thought coming from the key informants also supported this same view indicating that taboos respected in the community and respect given to local leaders have a great and positive contribution to veld-fire management in the affect communities. The key informant said;

“Local leaders are important in their capacity to deal with veld-fires, there are already several ways they use to enforce values and ethics and these spill over to environmental as well as fire management. Traditional leaders have a voice over all people in the communities at the same time, they have traditional knowledge which they inherited from their fore-fathers. Naturally, these leaders are also custodians of environmental management, they help to ensure that all sacred places are protected from any form of harm. This in turn can be beneficial towards veld fire management....” (Key informant)

When this is reflected, it can be considered that there are IKS practices in place in the district which deals directly or indirectly with veld fires. Participants' and key informants' findings highlight the importance of Indigenous Knowledge Systems (IKS) in veld fire management in the Mazowe District. Firebreaks and beating fires with tree branches have been identified as effective practices for limiting the spread of veld fires. Bowman et al. (2011) discovered similar results regarding the role of IKS in veld fire management. Participants emphasized generational knowledge, recognizing that firebreaks formed by clearing grass around houses or farms create a barrier that fire cannot easily cross. This method safeguards their shelters but also protects them from other threats such as snakes. Similarly, the key informant from the Environmental Management Agency (EMA) acknowledged the proactive efforts of local communities in extinguishing fires using sand, water, and tree branches before EMA's arrival. These findings highlight the significance of cultural practices and community-led fire management initiatives. The comments of participants and key informants emphasize the importance of traditional leaders in ensuring effective fire management. Respect for local leaders, as well as conformity to taboos and traditional values, all contribute positively to veld fire management in communities. Traditional leaders act as environmental custodians and protect sacred sites from harm, which benefits veld fire management efforts indirectly.

The findings align with previous research that emphasizes the value of IKS in sustainable fire management. The use of firebreaks and beating fire with tree branches reflects the practical knowledge and wisdom embedded in indigenous communities. By integrating these IKS

practices with scientific knowledge and modern fire management techniques, a comprehensive approach to veld fire management can be achieved (Bizard, 2011). These findings highlight the need for recognition and support of IKS in fire management policies and programs. Collaborative efforts between local communities, traditional leaders, and government agencies such as EMA can enhance the effectiveness of fire management strategies. Acknowledging and incorporating IKS practices can lead to more resilient and sustainable fire management approaches in the Mazowe District.

4.3 Extent of IKS integration in veld fire management in ward 20 of Mazowe District

Data were also collected on the extent of IKS integration in veld fire management in Mazowe District. Several questions were sought after which include perceptions of participants towards the extent to which IKS is being integrated into veld fire management practices in Mazowe District. Participants were asked the question, ‘*To what extent do you believe IKS are currently integrated into veld fire management practices in Mazowe District?*’ Figure 4.2 illustrates the findings on the extent of IKS integration.

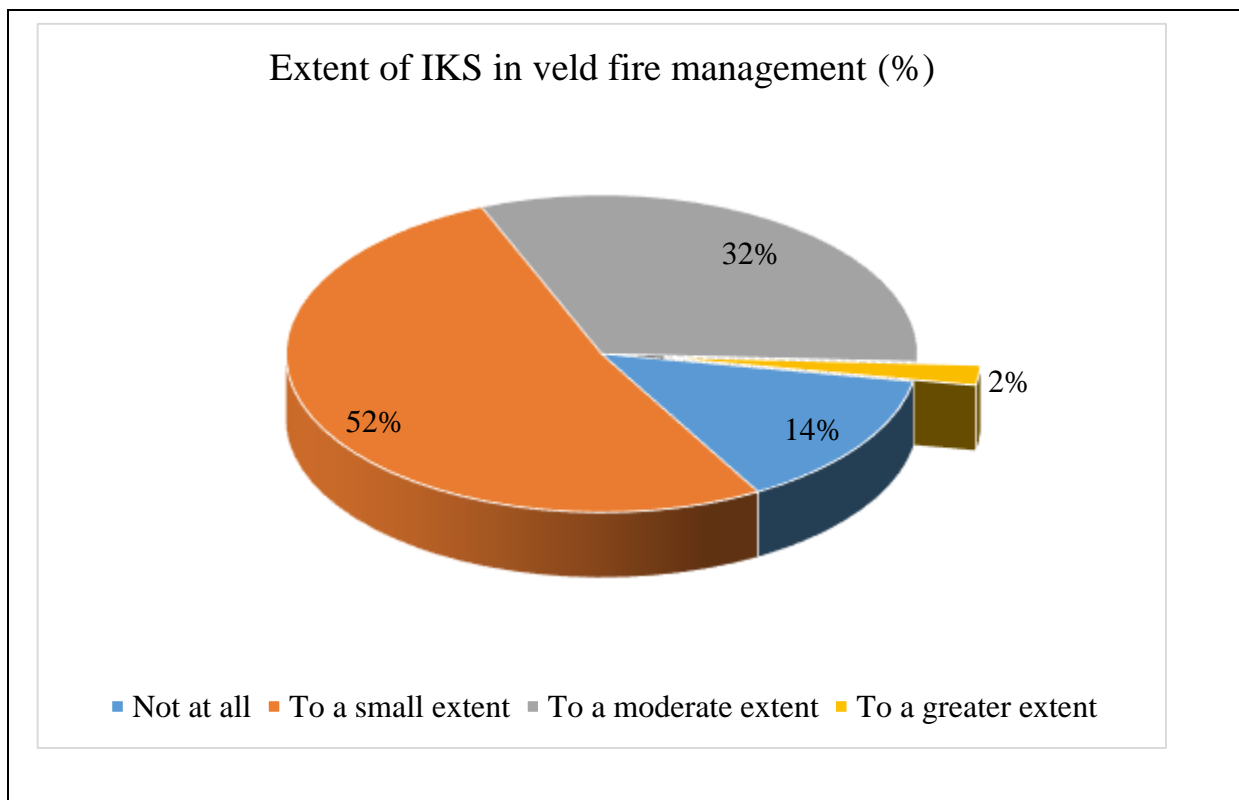


Figure 4.2: The extent of IKS integration in veld fire management in Mazowe District

As highlighted in figure 4.2, 14% of the participants indicated that there was no integration of IKS at all, while 52% of the participants highlighted that there was integration to a small extent while 32% said the extent was moderate and 2% saying there is greater integration extent. This means that, majority of participants perceived that indigenous knowledge is still underutilized in veld fire management in the area of study. These findings also concurred with one of the key informants who indicated that;

“The local knowledge is quite important in addressing issues of veld fires in the area but little is being done to fully utilize the local knowledge available. It looks like relevant stakeholders are not taking serious the need to work together with local people who are rich in knowledge when implementing different veld fire management practices in various areas...” (Key informant)

Another key informant also indicated that;

“Veld fire management stakeholder should take advantage of the knowledge already existing in the community. At the moment there is limited collaborations between people in the communities and environmental management officials when it comes to veld fire management” (Key informant)

The findings first acknowledge the importance of integrating IKS in veld fire management, but also showing that the uptake of the knowledge is still limited in the area of study. This could be related to lack policies and regulations in place to promote the integration of IKS in veld fire management. The study also looked into the availability of policies and regulations which contribute to IKS integration in veld fire management as a way of further assess the extent to which IKS is being integrated into veld fire management practices. Figure 4.3 gives a summary on the availability of policies and regulations in place to promote IKS integration in veld fire management.

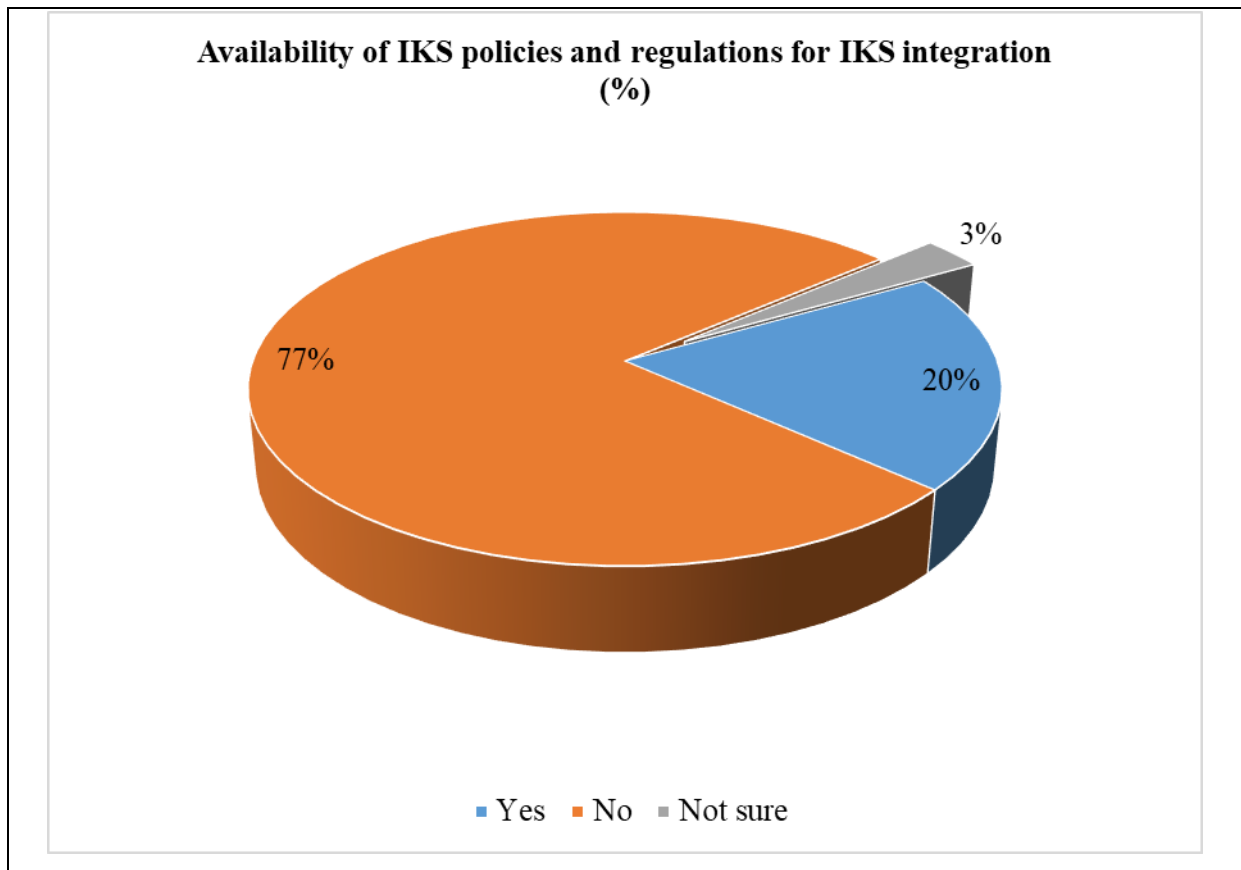


Figure 4.3: Availability of policies and regulations for promoting IKS integration in fire management

Figure 1Figure 4.3: Availability of policies and regulations for promoting IKS integration in fire management

Findings in figure 4.3 shows that majority (77%) could not recognize any policy or regulation which officiate the integration of IKS in veld fire management, 20% indicated that there was integration and 3% did not give any side in terms of the question. One of the key informants also supported the findings saying,

“Honestly I do not know of any guideline at local level which helps to encourage the working together of communities and environmental scientists towards fire management. Local people utilize their knowledge while environmental managers implement their policies and laws which are parallel to local understanding of fire management processes....”

This means that the extent of IKS integration in veld fire management practices in the study area might also be affected by lack of binding policies and regulations to govern the whole process. Integration of IKS by involving indigenous communities in decision-making processes and recognizing their traditional practices is quite imperative in dealing with risks

such as veld fires (Nyoni et al., 2020). There is need to come up with ways which can be used to regulate fire management practices at the same time taking into account the local knowledge. Community-based natural resources management (CBNRM) approach also emphasizes that, local stakeholder participation in various aspects of planning, research, development, management, and policy-making processes within a community makes response to risks in communities such as veld fires (Balint & Mashinya, 2005).

4.4 Effectiveness of Integrating IKS and Scientific Knowledge on Veld Fire Management in Mazowe District.

Furthermore, the researcher also aimed at assess the opinions of participants on the effectiveness of integrating IKS and scientific knowledge towards veld fire management in Mazowe community. Table 4.1 summarises the findings on the effectiveness of integrating IKS in veld fire management. Questions were placed on a 5-point likert scale where;

5 **4** **3** **2** **1**
Strongly agree **Agree** **not sure** **disagree** **Strongly disagree**

Table 4.1: Effectiveness of integrating IKS and Scientific Knowledge on veld fire management in Mazowe District

	5	4	3	2	1
Effectiveness of integrating IKS in veld fire management					
Integrating IKS and scientific knowledge in veld fire management can enhance the effectiveness of fire prevention and control measures	31.4%	54.3%	5.7%	8.6%	0
The combination of IKS and scientific knowledge leads to a more comprehensive understanding of fire behaviour and its ecological impact.	71.4%	8.6%	8.6%	8.6%	2.9%
Collaborative efforts between local communities and scientific experts are essential for successful integration of IKS and scientific knowledge in	57.1%	31.4%	0	8.6%	2.9%

veld fire management.					
Integrating IKS and scientific knowledge can improve community resilience and adaptive capacity in the face of veld fires.	68.6%	22.9%	0	5.7%	2.9%
Integrating IKS and scientific knowledge builds community participation towards veld fire management.	31.4%	60.0%	0	2.9%	5.7%
The integration of IKS and scientific knowledge can lead to the development of context-specific and culturally appropriate veld fire management strategies.	77.1%	14.3%	0	5.7%	2.9%

Table 4.1 shows that there is a general positive perception of the effectiveness of integrating Indigenous Knowledge Systems (IKS) and scientific knowledge in veld fire management. These findings highlight the importance and possibility for integrating traditional wisdom into fire fighting practices. One notable finding is that integrating IKS and scientific knowledge improves the effectiveness of veld fire control and prevention techniques (54.3%). This suggests that combining traditional practices, such as firebreaks and using of tree branches, with scientific methods can help to improve fire management strategies.

The bulk agreement (71.4%) that the blend of IKS and scientific knowledge leads to a full understanding of fire behaviour and its environmental impact is significant. This finding emphasizes the complementary nature of various knowledge systems, as well as the potential for a holistic approach to fire management that incorporates both traditional wisdom and scientific insights. The fact that a majority (57.1%) strongly agrees with the statement emphasizes the importance of collaboration between local communities and scientific experts. This emphasizes the importance of inclusive and participatory approaches in which local knowledge holders and scientific professionals collaborate to develop effective fire management strategies sensitive to local contexts and cultural practices. This is also similar to the statement by one of the key informants;

“Collaboration between local people and scientists has a significant potential of creating the knowledge needed for veld fire in Mazowe District. Given that the local people of Mazowe have lived with veld fire incidences for many years, hence, they have better knowledge which can be joined with science to produce resilience within the community. Integration of local knowledge may also be valid for early warning systems...” (Key informant)

The findings also indicate that combining IKS and scientific knowledge can boost the community's resilience and capacity for adaptation in the wake of veld fires. This is a promising finding because it suggests that incorporating traditional knowledge can help communities respond to fires more effectively and reduce their impact. It is noteworthy that integrating IKS and scientific knowledge increases community participation in veld fire management. It implies that by recognizing and valuing local knowledge, communities can become more actively involved in fire management efforts, resulting in increased ownership and effectiveness of the strategies put in place. One of the participants further commented;

“In many instances, people in this community collaborate to fight veld fires using our available traditional ways and resources such as pouring sand or beating with fresh tree branches. We know that pouring water is not always the best fire fighting method, using sand is sometimes more effective than water...” (Participant)

This shows that community members themselves have some success stories to share as far as fighting veld fires through integration of IKS is concerned. There is therefore, a need to take this more seriously.

Finally, there is strong agreement (77.1%) that integrating IKS and scientific knowledge can lead to the development of context-specific and culturally appropriate fire management strategies. This highlights the significance of developing approaches to the local environment, recognizing cultural practices, and maintaining that fire management strategies are relevant and effective for the communities that they are meant to serve. These findings, for the most part, highlight the potential benefits of integrating IKS and scientific knowledge in veld fire management. They emphasize the importance of collaborative, inclusive, and culturally sensitive fire management practices.

It is feasible to develop stronger, context-specific, and long-term veld fire management strategies by recognizing and leveraging the strengths of various knowledge systems.

Indigenous people in Zimbabwe play an important role in the conservation of forests and grasslands within communal areas; thus, their local knowledge is critical in the management of veld fires, which pose a threat to forests and grasslands. These indigenous people utilize their local knowledge to develop conservation strategies that have helped these natural resources thrive (Mawere, 2014). Making investments in Indigenous Knowledge (IK) for fire prevention and management can help to ensure that forest resources continue to provide various goods and services in a sustainable manner.

4.5 Chapter conclusion

This chapter was on the research findings and discussions. The research findings emphasized the significance of identifying and appreciating IKS in veld fire management. The combination of IKS and scientific knowledge has the potential to improve fire prevention and control methods, increase community resilience, leading to veld fire management strategies which involves the local people. Combined methods that comprise of local communities, traditional leaders, and scientific experts become useful for integration of knowledge systems and the application of effective fire management practices. The next chapter will be on summary, and recommendations.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Based on the findings and analysis presented throughout this study, this chapter provides a detailed summary, conclusion, and recommendations on the effectiveness of integrating Indigenous Knowledge Systems (IKS) and scientific knowledge in veld fire management in the Mazowe District. This study seeks to make a contribution to the realization of how traditional practices and scientific methods can be combined to enhance fire management strategies by examining indigenous systems of knowledge related to veld fire management, determining the extent of IKS integration, and examining the effectiveness of integrating IKS and scientific knowledge. The chapter will highlight significant findings, draw conclusions based on these findings, and then offer useful suggestions for policymakers, practitioners, and researchers to promote IKS integration in veld fire management practices.

5.2 Summary of key findings

The key results related to indigenous knowledge systems linked to veld fire management in the Mazowe District, specifically in Ward 13, emphasize the recognition and use of various traditional practices. Controlled burning, the use of fire beaters, the establishment of firebreaks, the planting of fire-resistant hedges/trees, regulation through traditional leadership, oral education and awareness, and the use of sand to put out fires are all commonly mentioned IKS practices. The community regards these practices as useful and relevant, indicating their recognition of the importance of cultural practices in veld fire management. Respect for taboos, adherence to cultural restrictions, and the role of traditional leaders are all seen as beneficial to fire management efforts. Overall, these findings highlight the significance of indigenous people.

The main findings concerning the extent of indigenous knowledge systems (IKS) integration in veld fire management in the Mazowe District show that the majority of participants perceived a limited integration of IKS in fire management practices. About 14% of participants said there was no integration at all, 52% said there was a small amount of integration, 32% said there was a moderate amount of integration, and only 2% said there

was a greater amount of integration. These findings were supported by key informant perspectives, which emphasized that relevant stakeholders are not fully utilizing the local knowledge available in the community. Furthermore, there was a clear lack of policies and regulations to promote IKS integration in veld fire management, with 77% of participants unable to identify any such guidelines. It suggests that the lack of binding policies and regulations governing the process may be to blame for the limited integration of IKS in fire management practices. It is recognized, however, that involving cultural groups in the decision-making process and recognizing their traditional practices is critical in effectively addressing risks such as veld fires. As a result, mechanisms that regulate fire management while incorporating local understanding and promoting community-based approaches are required.

The findings highlight the potential advantages of combining IKS and scientific knowledge in veld fire management. They stress the significance of collaboration, community involvement, and context-specific approaches. It is possible to come up with stronger and more effective fire management strategies that are both sustainable and culturally appropriate by recognizing and leveraging the strengths of various knowledge systems. Investing in Indigenous Knowledge for Fire Prevention and Management can help to conserve forests and grasslands while also ensuring the continued supply of vital resources in a sustainable manner.

5.3 Conclusion

After looking at the findings, it can be concluded that, there is a significant presence of Indigenous Knowledge Systems (IKS) related to veld fire management in the Mazowe District. The incorporation of IKS and scientific knowledge in veld fire management is acknowledged as critical for improving the effectiveness of fire prevention and control measures. This means that there is a need to enhance the IKS and integrate them with modern science towards veld fire management.

A conclusion was also made that the level of IKS integration in veld fire management is still below average in the Mazowe District. There is still parallel operation between scientific methods of managing veld fires and IKS.

According to the findings of the study, combining traditional practices with scientific methods leads to a more comprehensive understanding of fire behaviour and its

environmental impact. Collaboration efforts among local communities and scientific experts are critical for successful IKS and scientific knowledge integration. Integrating IKS and scientific knowledge strengthens community resilience and adaptive capacity in the face of veld fires, as well as community participation in fire management. In addition, combining IKS and scientific knowledge allows for the development of context-specific and culturally appropriate fire management strategies. In general the study emphasizes the potential benefits of incorporating IKS into fire management practices, as well as the importance of collaboration and inclusivity in developing effective and long-term strategies.

5.4 Recommendations

Basing on the study findings it was therefore recommended that;

- The study identified that there is lack of policy frameworks to champion integration of IKS and Scientific Knowledge in veld fire management. In relation to this, policymakers and communities should actively promote the recognition and awareness of Indigenous Knowledge associated with veld fire management. This includes recognizing and incorporating the value and effectiveness of traditional practices into fire management strategies.
- There are no platforms to promote collaborations between scientists and local people, hence, there is need to persuade local communities and scientific experts to collaborate and share their knowledge. This can be accomplished by holding regular meetings, workshops, and forums where traditional knowledge holders and scientific professionals can share their insights and experiences.
- The creation as well as execution of veld fire management strategies must involve communities nearby. Communities should be given a say in decision-making processes in order to guarantee that strategies are contextually appropriate, culturally relevant, and responsive to their needs.
- Academic institutions should encourage study projects aimed at documenting and preserving Indigenous knowledge about veld fire management. The documentation of traditional practices, local fire management strategies, and the ecological impact of fires is part of this effort to ensure the continuity and transmission of this knowledge to future generations.

- Authorities should incorporate Indigenous Knowledge about veld fire management into formal education curricula at all levels. This will help to raise awareness among younger generations, as well as foster pride and appreciation for traditional practices.

REFERENCES

- Ali, T., Buergelt, P. T., Maypilama, E. L., Paton, D., Smith, J. A., & Jehan, N. (2022). Synergy of systems theory and symbolic interactionism: a passageway for non-Indigenous researchers that facilitates better understanding Indigenous worldviews and knowledge. *International Journal of Social Research Methodology*, 25(2), 197-212.
- Balint, P.J., & Mashinya, J. (2005). "The decline of a model Community-based conservation project: Governance, capacity, and devolution in Mahenye, Zimbabwe." *Geoforum*. 37: 805–815. [Doi:10.1016/j.geoforum.2005.01.011](https://doi.org/10.1016/j.geoforum.2005.01.011)
- Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*, 90(5), 1692-1702.
- Berkes, F. (2012). *Sacred ecology* (3rd ed.). Routledge.
- Bowman, D. M. J. S., et al. (2011). The human dimension of fire regimes on Earth. *Journal of Biogeography*, 38(12), 2223-2236.
- Cochrane, M. A. (2003). Fire science for rainforests. *Nature*, 421(6926), 913-919.
- Copes-Gerbitz, K., Hagerman, S., & Daniels, L. (2021). Situating Indigenous knowledge for resilience in fire-dependent social-ecological systems. *Ecology and Society*, 26(4).
- Finn, S., Herne, M., & Castille, D. (2017). The Value of Traditional Ecological Knowledge for the Environmental Health Sciences and Biomedical Research. *Environmental health perspectives*, 125(8), 085006. <https://doi.org/10.1289/EHP858>
- Frake, C. O. (1962). The ethnographic study of cognitive systems. In P. P. Wiener (Ed.), *Readings in cultural anthropology* (pp. 487-498). Thomas Y. Crowell Co.
- Hill, R., Walsh, F. J., Davies, J., Sparrow, A., Mooney, M., Council, C. L., & Tengö, M. (2020). Knowledge co-production for Indigenous adaptation pathways: transform

- post-colonial articulation complexes to empower local decision-making. *Global Environmental Change*, 65, 102161.
- Hiwasaki, L., Luna, E. & Syamsidik, S.R. (2014). *Local and indigenous knowledge for community resilience: Hydro-meteorological disaster risk reduction and climate change adaptation in coastal and small island communities*, UNESCO, Jakarta.
- Huffman, M. R. (2013). The many elements of traditional fire knowledge: Synthesis, classification, and aids to cross-cultural problem solving in fire-dependent systems around the world. *Ecology and Society*, 18(4).
- Iloka, N.G. (2016). 'Indigenous knowledge for disaster risk reduction: An African perspective', *Jàmbá: Journal of Disaster Risk Studies* 8(1), a272. <https://doi.org/10.4102/jamba.v8i1.272>
- Jessen, T. D., Ban, N. C., Claxton, N. X., & Darimont, C. T. (2022). Contributions of Indigenous Knowledge to ecological and evolutionary understanding. *Frontiers in Ecology and the Environment*, 20(2), 93-101.
- Joralemon, D. (2010). Cultural adaptation. In *International Encyclopedia of Education* (pp. 319-323). Elsevier
- Kimmerer, R. W. (2002). Weaving traditional ecological knowledge into biological education: A call to action. *BioScience*, 52(5), 432-438.
- Kugara, S. L., & Mokgoatšana, S. (2022). Challenges presented by digitisation of VhaVenda oral tradition: An African indigenous knowledge systems perspective. *HTS Teologiese Studies/Theological Studies*, 78(3), 7428.
- Lambert, S., & Mark-Shadbolt, M. (2021). Indigenous knowledge of forest and biodiversity management: How the watchfulness of Māori complements and contributes to disaster risk reduction. *AlterNative: An International Journal of Indigenous Peoples*, 17(3), 368-377.
- Matsui, K. (2015). 'Problems of defining and validating traditional knowledge: A historical approach', *The International Indigenous Policy Journal* 6(2), 1–25. <https://doi.org/10.18584/iipj.2015.6.2.2>

- Mawere, M. (2010). 'Indigenous knowledge systems' (IKSs) potential for establishing a moral, virtuous society: Lessons from selected IKSs in Zimbabwe and Mozambique', *Journal of Sustainability Development in Africa* 12(7), 209–221.
- Mawere, M. (2014). *Culture, indigenous knowledge and development in Africa: Reviving interconnections for sustainable development*. Langaa Rpcig.
- Mercer, J., Kelman, I., Taranis, L. & Suchet-Pearson, S. (2010). 'Framework for integrating indigenous and scientific knowledge for disaster risk reduction', *Disasters* 34(1), 214–239. <https://doi.org/10.1111/j.1467-7717.2009.01126.x>
- Montag, J. M., Swan, K., Jenni, K., Nieman, T., Hatten, J., Mesa, M., & Maule, A. (2014). Climate change and Yakama Nation tribal well-being. *Climatic Change*, 124, 385-398.
- Mutasa, M. (2015). 'Knowledge apartheid in disaster risk management discourse: Is marrying indigenous and scientific knowledge the missing link?' *Jàmbá: Journal of Disaster Risk Studies* 7(1), Art. #150, 1–10. <https://doi.org/10.4102/jamba.v7i1.150>
- Nyoni, Z., Munyati, C., & Hove, L. (2020). Integrating Traditional Knowledge and Modern Science for Climate Change Adaptation in Africa. In *Indigenous Knowledge Systems and Climate Change Management in Africa* (pp. 193-211). Springer.
- Pyne, S. J. (1997). *Vestal fire: An environmental history, told through fire, of Europe and Europe's encounter with the world*. University of Washington Press.
- Reid, R. S., Nyumba, T. O., & Mbatha, K. R. (2020). Indigenous knowledge systems and adaptive management: Learning from the Maasai and Rendille of Kenya. *Ecology and Society*, 25(3), 16.
- Russell-Smith, J., et al. (2009). Contemporary fire regimes of northern Australia, 1997-2001: Change since Aboriginal occupancy, challenges for sustainable management. *International Journal of Wildland Fire*, 18(7), 724-737
- UNISDR (2015). *Sendai Framework for Disaster Risk Reduction 2015–2030*, UNISDR, Geneva.

Varghese, J., & Crawford, S. S. (2021). A cultural framework for Indigenous, Local, and Science knowledge systems in ecology and natural resource management. *Ecological Monographs*, 91(1), e01431.

Vázquez-Varela, C., Martínez-Navarro, J. M., & Abad-González, L. (2022). Traditional fire knowledge: a thematic synthesis approach. *Fire*, 5(2), 47.

APPENDIX 1

QUESTIONNAIRE FOR PARTICIPANTS IN MAZOWE DISTRICT

Dear respondent

My name is Kudzaiishe Mubaiwa a student in Disaster Management Studies at Bindura University of Science Education. I am currently studying on the prospects of integrating indigenous knowledge systems (IKS) in veld fire management practices in Mazowe District. I kindly request for your assistance through responding to the following questions. All the information provided will only be used for academic purposes and remains confidential.

Your cooperation will be greatly appreciated

SECTION A: INDIGENOUS KNOWLEDGE PRACTICES RELATED TO VELD FIRE MANAGEMENT IN MAZOWE DISTRICT

1. Have you ever witnessed or experienced veld fires in Mazowe District?
 - a. Yes
 - b. No
2. Are you aware of Indigenous Knowledge practices related to veld fire management?
 - a. Yes
 - b. No
3. If yes please state the IK practices you are aware of.
 - a.
 - b.
 - c.
 - d.

- e.
 - f.
4. Have you personally practiced any indigenous knowledge practices for veld fire management?
 - a. Yes
 - b. No
 5. If yes, please describe the practices you have been into.
 - a.
 - b.
 - c.
 - d.
 - e.
 6. Are there any specific cultural beliefs or rituals associated with veld fire management in your community?
 - a. Yes
 - b. No
 7. If yes, please describe the cultural beliefs or rituals related to veld fire management in your community.
 - a.
 - b.
 - c.
 - d.
 - e.

SECTION B: INTEGRATION OF IKS IN VELD FIRE MANAGEMENT IN MAZOWE DISTRICT

8. To what extent do you believe IKS are currently integrated into veld fire management practices in Mazowe District?
 - a. Not at all
 - b. To a small extent
 - c. To a moderate extent
 - d. To a great extent
9. Are there any policies or regulations in place to promote the integration of IKS in veld fire management in your area?

- a. Yes
- b. No
- c. Not sure

10. In your opinion, what are the key benefits of integrating IKS in veld fire management?

.....
.....
.....
.....

11. How can the integration of IKS in veld fire management contribute to the sustainability of ecosystems and communities in the Mazowe District?

.....
.....
.....
.....

12. Are there any specific IKS practices or techniques that you believe should be prioritized for integration into veld fire management efforts?

.....
.....
.....
.....

13. What steps or actions do you think should be taken to enhance the integration of IKS in veld fire management in the Mazowe District?

.....
.....
.....
.....

14. Are there any success stories or examples where IKS has been effectively integrated into veld fire management in the Mazowe District?

.....
.....

.....

15. Do you have any additional comments, suggestions, or insights regarding the integration of IKS in veld fire management?

.....

SECTION C: EFFECTIVENESS OF INTEGRATING IKS AND SCIENTIFIC KNOWLEDGE IN VELD FIRE MANAGEMENT IN MAZOWE DISTRICT.

16. To what extent do you agree to the following questions on the effectiveness of integrating IKS and scientific knowledge in veld fire management in Mazowe District?

5 4 3 2 1
 Strongly agree Agree not sure disagree Strongly disagree

	5	4	3	2	1
Effectiveness of integrating IKS in veld fire management					
D1. Integrating IKS and scientific knowledge in veld fire management can enhance the effectiveness of fire prevention and control measures					
D2. The combination of IKS and scientific knowledge leads to a more comprehensive understanding of fire behaviour and its ecological impact.					
D3. Collaborative efforts between local communities and scientific experts are essential for successful integration of IKS and scientific knowledge in veld fire management.					

D4. Integrating IKS and scientific knowledge can improve community resilience and adaptive capacity in the face of veld fires					
D5. There is sufficient recognition and support from relevant authorities for the integration of IKS and scientific knowledge in veld fire management.					
D6. The integration of IKS and scientific knowledge can lead to the development of context-specific and culturally appropriate fire management strategies.					

17. In your experience, what specific examples or practices demonstrate the effectiveness of integrating IKS and scientific knowledge in veld fire management?

.....

.....

.....

.....

18. What are the key strengths of IKS and scientific knowledge that make their integration valuable in veld fire management?

.....

.....

.....

.....

19. Are there any challenges or limitations associated with the integration of IKS and scientific knowledge in veld fire management? If so, please describe.

.....

.....

.....

20. How can the integration of IKS and scientific knowledge be further improved in veld fire management efforts in the Mazowe District?

.....

.....

.....

21. What are your recommendations for promoting and supporting the integration of IKS and scientific knowledge in veld fire management at the community and policy levels?

.....
.....
.....

End of questionnaire

APPENDIX TWO: INTERVIEW GUIDE FOR KEY INFORMANTS

Introduction and Background

1. Please introduce yourself and provide a brief overview of your experience and involvement in veld fire management in the Mazowe District.
2. Can you share any insights into the history and importance of veld fire management in the Mazowe District?

Indigenous Knowledge Systems (IKS) Linked to Veld Fire Management

3. In your understanding, what are the key indigenous knowledge systems or practices linked to veld fire management in the Mazowe District?
4. Can you provide specific examples of how local communities in the Mazowe District utilize indigenous knowledge systems to prevent, control, or manage veld fires?
5. How have these indigenous knowledge systems been passed down through generations in the community?

Integration of IKS in Veld Fire Management

6. How would you describe the current level of integration of IKS in veld fire management practices in the Mazowe District?
7. Can you identify any initiatives, programs, or policies that promote or support the integration of IKS in veld fire management?

8. What challenges or barriers exist in integrating IKS into veld fire management efforts?
9. Are there any successful examples where IKS has been effectively integrated into veld fire management in the Mazowe District?

Effectiveness of Integrating IKS and Scientific Knowledge

10. In your opinion, what are the potential benefits of integrating IKS and scientific knowledge in veld fire management?
11. Can you provide any specific examples or instances where the integration of IKS and scientific knowledge has improved veld fire management outcomes?
12. What are the key strengths and limitations of integrating IKS and scientific knowledge in veld fire management?
13. How do you perceive the level of recognition and support for integrating IKS and scientific knowledge in veld fire management?

Collaboration and Knowledge Exchange

14. How important is collaboration and knowledge exchange between local communities, scientific experts, and relevant stakeholders in the successful integration of IKS and scientific knowledge in veld fire management?
15. Are there any mechanisms or platforms in place to facilitate collaboration and knowledge exchange between different knowledge systems?
16. What steps can be taken to enhance collaboration and knowledge exchange between IKS and scientific knowledge practitioners?

Recommendations and Future Directions

17. Based on your experience and insights, what recommendations would you provide to promote and preserve indigenous knowledge systems linked to veld fire management in the Mazowe District?
18. How can the integration of IKS and scientific knowledge be further improved to enhance veld fire management outcomes in the Mazowe District?

End of Interview