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TOPIC: AN ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS VELD FIRES AMONG SMALL SCALE FARMERS AT MANHENGA RURAL DISTRICT

A project submitted to the department of Safety, Health and Environmental Management for Partial fulfillment of the requirements for the BSc. Honors Degree in Safety, Health and Environmental Management

Declaration

To be compiled by the student

Registration number: B191034B

I MUNASHE NIKISI, do here-by declare that this work-related research project is my work and has not been submitted before.

Signature……Date…….…….

To be compiled by the supervisor

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

Signature……Date…….…….

Dedication

To the countless individuals whose tireless efforts have made this research project possible. I extend my deepest gratitude to my father D. Nikisi, mother J. Nikisi and my younger siblings Tanyaradzwa and Mufaro Nikisi.Your belief in our abilities and unwavering support has been essential to my success. May God bless you all.

ACKNOWLEDGEMENTS

I would like to thank my academic supervisor Mr. T Nyamugure for mentoring and supervising me at all stages during the research projects. I would like to express my gratitude to my family for their support, through prayers and financially during the research. Above all I thank the Lord for guiding and protecting me during the course of the research.

Abstract

Background: Mashonaland Central is ranked amongst the provinces which experience veld fires. As such, the study aimed to assess the knowledge, attitude and practices among small-scale farmers in Manhenga Rural District towards veld fires. Veld fires harm the environment by increasing the likelihood of excessive erosion by altering the soil profile. Small-scale farmers owe it to their properties to take the necessary safeguards for fire suppression. Although it is obvious that efforts are being made to put out veld fires, it is concerning to see that the ability of the local communities to do so has deteriorated and the veld fire has grown to be a serious hazard.

Materials and methods: Data was collected using questionnaires and field observations. Analyzed using the Statistical Package for Social Scientists (SPSS) version 20 and Microsoft Excel. A total of thirty-eight respondents. Questions were on demographic characteristics, knowledge, attitudes and practices. Chi-square was used to analyze between demographic factors and KAP variables.

Data analysis: SPSS and Microsoft Excel were used. The responses were categorized as “yes”, ‘no’ and ‘I don’t know’. Binary analysis was used to determine factors affecting knowledge, attitudes and practices. Results were presented with tables and graphs. Statical analysis employed a 95% confidence interval and 5% level of significance.

Results: A total of thirty-two questionnaires were distributed ,78.1% of respondents were female and 21.9 % were male. Calculated mean score (12.09) majority of small-scale farmers had knowledge on causes and impacts of veld fires. Mean attitude score of (4.81) on attitude of small-scale farmers towards veld fires which was fair Mean score (4.675) on practices towards veld fires which was fair.

Conclusion: Farmers in Manhenga community had knowledge on veld fires. Attitudes towards veld fires was poor but the small-scale farmers are willing to attend and learn. Practices were also poor towards veld fires. Adoption of disposal of house-hold ash into dug pits in close proximity to the homestead reduces the occurrence of veld fires. Women had a good knowledge, positive attitude and good practices towards veld fires.

Recommendations: Whistle blowers to report individuals that are seen disposing of lit cigarette studs and also using fire as a method of land clearance among small-scale farmers.

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LIST ACRONYMS

KAP	Knowledge, Attitude and Practices
EMA	Environmental Management Agency
SPSS	Statistical Package for Social Scientist
ZRP	Zimbabwe Republic Police

CHAPTER 1

INTRODUCTION

1.0Introduction

This chapter comprises of the background to the study, problem statement, research aim, objectives, research questions and justification. On the assessment of knowledge, attitude and practices towards veld fires among small-scale farmers in Manhenga Rural District.

1.1 Background of the study

In a mix of wood and grassland, veld fires have become more frequent and severe (Mabaso, et al., 2020). Most of the veld fire outbreaks are as a result of human activities such as improper dumping of lit cigarette studs, burning crops to prepare fields for cultivation, use of fire by hunters and smoking out bees (Dube, 2015). Conflicts amongst villagers, collisions of electric cables, controlled burning, not complying with proper fire management techniques and negligence (Mabaso, et al., 2020).

Lightning (cold flush and hot flush) contributes to the natural process that causes veld fire (Diphagwe, et al., 2021). Veld fires harm the environment by increasing the likelihood of excessive erosion by altering the soil profile. Small-scale farmers owe it to their properties to take the necessary safeguards for fire suppression. Fire prevention measures include the construction of fireguards which are 9 meters wide before the fire season, firefighting teams within the local community, firefighting equipment e.g., fire beaters and carrying out fire campaigns (Environmental Management Regulations, 2007).

Chapter 19:05 of the Forestry Act and the Environmental Impact Assessment and Ecosystems Protection Regulations, Statutory Instrument 7 of 2007. Specifies that before the fire season starts, typical fire guards should be at least 9 meters wide. Burning under control in densely forested areas to reduce biomass (Environmental Management Agency, 2021). The rapid spread of veld fires is slowed down by installing fire buffers to divide the land into blocks or camps. By using the brakes, the fire can be put out in its tracks. The owner who wants to burn his field must give his neighbor written notice at least 14 days in advance. When burning is being done along the shared boundary, the neighbor should be there.

Although it is obvious that efforts are being made to put out veld fires, it is concerning to see that the ability of the local communities to do so has deteriorated and the veld fire has grown to be a serious hazard. There are several issues with the veld fire technology and information exchange systems now in use. These include ineffective fire prevention systems, unaware farmers, and inadequate communication when burning crops (Jere, et al., 2017). Veld fires, which cause uncontrolled flames that ravage large areas of grassland and forest, disrupt biodiversity, and even cause fatalities, are sometimes caused by improperly managed fires on properties (Nyamadzawo, et al., 2013).

Destruction of critical environmental resources, loss of biodiversity, damage to infrastructure, and disruption of rural and urban lifestyles are just a few examples (Mabaso, et al., 2020). Due to the dry climate, most fires occur during the fire season, which lasts from July to October. Currently, no one is allowed to light fires outside their homes. To combat wildfires, the EMA (Environmental Management Agency) has worked with local communities to implement fire prevention measures such as building fire stations, baling hay, and training firefighters (ZIMFact Sheet, 2022).

Wildfires in Australia have burned more than 46 million acres of land, killed 34 people in New South Wales, left 3.500 homeless, dead, damaged infrastructure and burned down the Northern Territory It occupied about one-third of the area. Many of the burnt structures were agricultural buildings (Diphagwe, et al., 2021). Africa is considered the most fire-prone continent in the world. South African community faces the challenge of grassland fires, also known as wildfires. These fires can be naturally occurring or man-made. Although they are destructive, they also play an ecological role in ecosystems. Fire has been part of ecosystems for centuries and has also become a vital management tool for domestic and commercial land users for example farmers for vegetation management (Belle & Lubanga, 2021).

Zimbabwe is one of the most fire-prone countries in sub-Saharan Africa. More than one million hectares of land are destroyed by wildfires each year during the wildfire season, which runs from July to November. Wildfires are caused by multiple factors, cause enormous social and economic losses, and are difficult to monitor (Chinamatira, et al., 2016). According to Nyamadzawo (2013), records indicate that grassland fires in Zimbabwe in 2012 destroyed more than 1 million hectares of forest and destroyed millions of plant and animal species. In addition, a value of over $200,000.

rice field of property damage. Mashonaland Central is one of the states at very high wildfire risk due to heavy rainfall season (Chigona, 2021).

1.2 Problem statement

Small-scale farmers in rural areas heavily rely on their crops for food consumption and other necessities. The knowledge, attitudes and practices of small-scale farmers towards veld fire management is critical in ensuring conservation of crops and livestock. However, there is a lack of understanding of the knowledge, attitude and practices of small-scale farmers in Manhenga Rural District towards veld fires This knowledge gap hinders the development and implementation of effective veld fire management strategies e.g., policies, acts and awareness campaigns

1.2 Research aim

To assess the knowledge, attitudes and practices towards veld fires amongst small-scale farmers in Manhenga rural area.

1.3 Objectives

1.To identify the knowledge among small-scale farmers towards veld fires in Manhenga rural communities.

2.To assess small-scale farmers' attitudes towards veld fires in the Manhenga rural area.

3.To asses small-scale farmers 'practices towards veld fires farmers in Manhenga rural area.

4.To relate KAP to socio-economic factors among small-scale farmers towards veld fires in Manhenga rural area.

1.4 Research questions

1.What is the knowledge among small-scale farmers towards veld fires in Manhenga rural area?

2.What is the attitude among small-scale farmers towards veld fires in Manhenga rural area?

3.What are the practices among small-scale farmers towards veld fires in Manhenga rural area?

4.What is the relationship between KAP and socio-economic factors towards veld fires in the Manhenga rural area?

1.5 Justification

This study will be beneficial to all stakeholders in the Manhenga Rural district involved in veld fire management. Having an understanding of veld fires will assist the community. Small scale farmers and the surrounding community knowledge and habits will aid in the fire suppression.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter contains previously published work on the assessment of knowledge, attitude and practices among small-scale farmers towards veld fires.

2.1 Definition of veld fire

Veld fire refers to an intense spread of fire in areas of dry grass and trees. African tropical savannas are listed among the most fire-prone ecosystems in the world (Chinamatira, et al., 2016). Fire outbreaks have increased crop losses, reduced food availability for humans and animals, slowed vegetation development, and destroyed facilities (Nyamadzawo, et al., 2013). This pushes resource-poor small-scale farmers further into the cycle of poverty (Chinamatira, et al., 2016). Veld fires can be classified based on a number of factors which are their cause, behavior and location. Namely surface fires, crown fires, ground fires, backfires and human cause fires (Cary, et al., 2009).The social and economic costs of fire and destruction are too great to ignore. Mabaso (2020) argues that while intentional fires are ignited and managed on various scales, unintentional fires can have devastating effects on people, ecosystems and the environment. increase.

2.2 Causes of veld fires

There are several activities that cause wildfires. The immediate causes of fire include people clearing land for cultivation, fumigating beehives, making charcoal, cooking or keeping warm, setting fires, and as a means of settling disputes. People are included for claiming that the recent increase in fires is being resettled (Chinamatira , et al., 2016). An accidental fire is a fire that does not require intentional human action to start the). Natural causes of fire can be attributed to various environmental factors such as lighting, volcanic activity and spontaneous combustion. This includes lightning, volcanic activity and spontaneous combustion fire. Human causes of veld fires include the improper disposal and handling of combustible materials (mainly by children), lightning strikes, burning candles, and striking electrical cables. In the agricultural sector, fire is still used for pasture restoration, removal of vegetation cover for human and agricultural purposes, pest control (to reduce insects and rodents), and destruction of invasive species (Mabaso, et al., 2020).

Domestic waste management is another factor in grassland fires. Waste disposal is a skilled task, especially when large amounts of waste are incinerated. Unregulated garbage burning in domestic backyard pits, landfills, and illegal landfills. Open burning is a common management practice for combustible waste treatment in rural areas for countries without formal waste management systems and in some urban areas where waste is disposed of in landfills. Such fires pose significant environmental, health, and economic risks and, in most cases, can go 'viral' (Dlamini, 2010).

2.3 Knowledge of small-scale farmers towards veld fires

Smallholder farmers are aware of the risks of wildfires, and agree that wildfires destroy infrastructure and crops (Hallsten & Trolltoft, 2023). Grassland fires erupted repeatedly, causing extensive property damage and fatalities. Preventive measures should be a priority to mitigate the effects of fire (Lambrechts, et al., 2023). Prevention of accidental outbreaks of steppe fires includes mechanical methods such as fire prevention, fire protection, grazing, and control of open burning (Lambrechts, et al., 2023). A multi-pronged approach has significantly reduced wildfire occurrence. risk mitigation at the individual farmers and communities he level, such as education and intervention, firebreaks and low fuel buffer zones (Ahmed, et al., 2018). Farmers know the past and current management strategies of their land, but the indigenous knowledge system has collapsed and as a result the knowledge is not put into practice. The reasons for this are the aging of the agricultural workforce and limited youth involvement in agricultural activities (Linnane, et al., 2023).

Uncontrolled, premature, or indiscriminate grassland fires pose a threat to healthy grasslands and good pastures in free states. Much of the protected area was destroyed as a result of fires that spread to adjacent areas, while much of the valuable rangeland on neighboring farms was destroyed. Indiscriminate or premature burning can have serious adverse effects on grass palatability and nutritional value in grasslands. This means that areas where grassland is still healthy are under greater grazing pressure (Masiteng, et al., 2003).

Remote sensing data show that between 2001 and 2009, the number of fires and area burned increased. In some tenures, the number of fires he had increased from 9 years to 80 years. According to projected trends, fire rates could drop to negative levels in three systems by 2026 and double in the other two systems. The problem may be solved if comprehensive strategies are

used to address grassland fires across sectors and landholdings (Maponga, et al., 2017). Even a high level of knowledge and a positive attitude often do not lead to perfect practice. Different contextual considerations for different behaviors and categories of farmers served as boundaries for their management practices (Kong, et al., 2014).

2.4 Attitude of small-scale farmers towards veld fires

Administrators of the Dutch of Cape considered burning as a bad practice hence they passed a law in 1687 which clearly mentioned the penalty for causing veld fires that lead to distraction of property "scourging" for the offence committed at first, and for the second offence the penalty was death by hanging (Trollope, 2011). At first the farmers' attitude towards veld fires was negative as compared to the positive state of thinking for indigenous farmers that led a communal lifestyle.

Information has clearly stated the use of veld fire as a farm management practice in Africa and suitable and reliable burning educational programs have been developed, taught in order to achieve commercial enterprises which includes livestock production, farming, and nature conservation in grasslands and savannas (Trollope, 2011). Most of the reasons stated for burning grassland and savanna vegetation in Africa involves the elimination of moribund and unacceptable grass. This is done to improve the quality of grazing grass for domestic livestock, land clearance in preparation for the growth of crops and facilitate slashing. Burning is also done to reduce the occurrence of these flies and reduce tick populations, for example babesiosis in livestock (Trollope, et al., 2003).

Farmers with small holdings do not become members because they believe they have nothing to fear. In this case, the information must be submitted as the legal liability is the same for both small and large farms. If a fire spreads from the land, the owner can be held responsible for its origin (Jelvinger, 2012). Despite the passing of many laws designed to prevent them, wildfires remain an ongoing problem. Agriculture, forestry, tourism and wildlife are the economic sectors most affected by wildfires. (Nyamadzawo, et al., 2013).

2.5 Practices of small-scale farmers towards veld fires

Additionally, practice sessions should be held to provide stakeholders with the necessary training (Dube, 2015). Farmers rake hills and canals along contour lines to provide pasture for their cattle. Tall grass should be cut along roads leading to grain bunkers, cowsheds, grain fields, homesteads, and farms to reduce the amount of fuel that causes fires.

Another problem is that if a fire spreads from a temporary resident's property, neighboring farmers are unlikely to be notified until the fire reaches their own farm. One of her farmers said her neighbor, a temporary resident, was not involved in preparing for wildfire season, but was always ready to help if a fire broke out while she was there. added (Jelvinger, 2012). Training for smallholder farmers should essentially focus on empowerment and economic and environmental practices. Therefore, development activities targeting smallholder farmers must be based on sound technical, financial and managerial procedures (Masiteng, et al., 2003).

Indigenous peoples, including mapping fire risk patterns with remote sensing, geoinformatics, and quantifying the impact of fire on livelihoods, food security, public health, hydrology, and greenhouse gas emissions on different spatial and temporal scales. knowledge systems using modern methods (Nyamadzawo, et al., 2013). According to Svotwa, fire issues are intertwined with social and sustainable development, and at the local level, the assessment explains why, where, when, who, what and how. The preparation of the National Fire Protection Plan by the Environmental Management Agency is a positive step. While it is important to identify community groups that can participate in local fire risk reduction initiatives, they target age groups, economic and social groups that commonly make fires for environmental education (Svotwa , et al., 2007)

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This section comprises of the study area, as well as the instruments that are to be used to assess the knowledge, attitude and practices towards veld fires among small-scale farmers in Manhenga rural District. Research strategy, target population as well as sampling methods used.

3.1 Description of study area

Manhenga Rural District lies in Bindura, located on the north-eastern part of Zimbabwe in Mashonaland Central Province. Coordinates of latitude -17.3969147 and longitude 32. 6524801.Receiving approximately annual rainfall 122,65mm. Temperatures range from a maximum of 25°C and minimum of 16°C. Arable land, the small-scale farmers practice the growing of food crops for example maize and groundnuts for food consumption and other needs. Weather conditions between July and October create a conducive and favorable environment for veld fires to spread vigorously.

LOCATION OF THE STUDY SITE

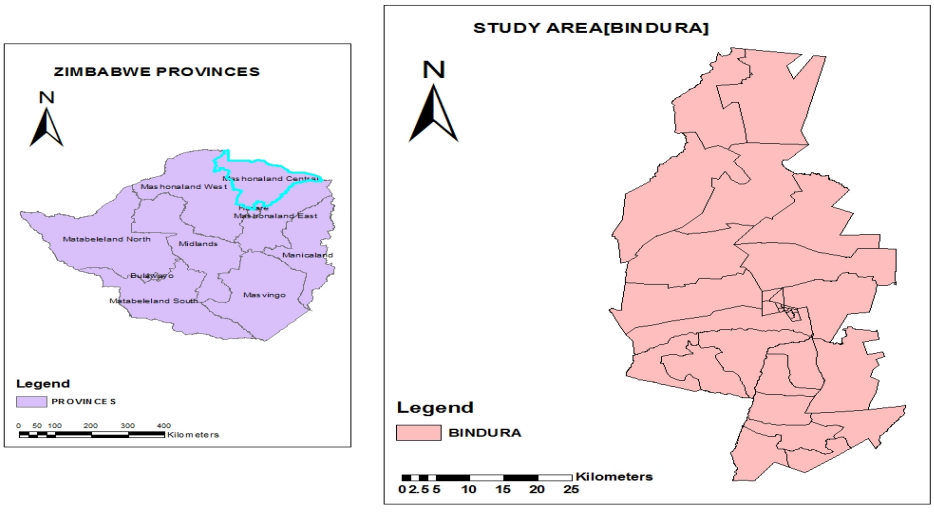


Figure 3.1:Map of Bindura, Manhenga Rural District study area.

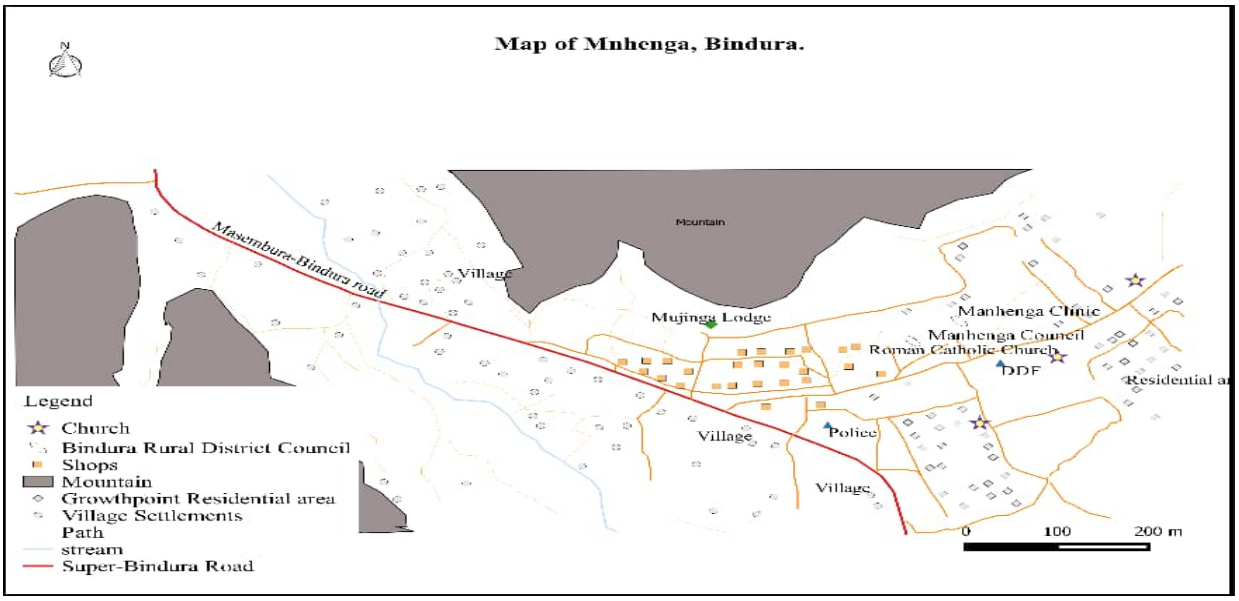


Figure 3.2: Map of Manhenga, Bindura.

3.2 Research design

A cross-sectional study, where information is collected from numerous different individuals at a single-point of time. In a cross-sectional study, the respondents are observed at a distance without affecting or influencing them. The cross-sectional study collects information from a large number of participants and provides a snapshot of the situation in the area at that exact time (Thomas , 2022).Quantitative data refers to information which deals particularly with numbers and statistics. While qualitative data refers to descriptive information and regards situations which can be observed but cannot be measured, for example language (Mcleod & Evans, 2023).In this research study, both qualitative and quantitative methods are to be used in the survey to increase accuracy. The research study is to be carried out between the month of March and April of 2023, before the start of the fire season.

3.3 Data sources

Primary data refers to the first-hand information that is obtained directly from the source while secondary data is the information that has been summed up by another individual earlier. Original and unique data from sources such as questionnaires', surveys, group discussions and direct observation (Ajayi, 2017).The sources for primary information were small-scale farmers that reside at Manhenga aged eighteen years up to fifty years. Targeted populations were male and

female who practiced growing food crops for family consumption. Direct observation is also classified under primary data sources.

Secondary data is information that is readily available and accessible. The information is not pure as it would have undergone through statistical treatments. The sources of secondary data are journal articles on fire ecology, websites, Environmental Management Agency reports on veld fire and Zimbabwe Acts of Parliament on environment (Ajayi, 2017).

3.4 Sampling method

Simple random sampling is a probability technique in which every individual has an equal chance of being chosen for a sample. In this context on the assessment of knowledge, attitude and practices towards veld fires amongst small scale farmers the researcher used simple random sampling method. Simple random sampling selecting at random small-scale farmers from the study area (Chauke, et al., 2019).Simple random sampling is simple to understand and implement.

3.5 Sample size

According to the recent census carried out in 2020 the population of Manhenga is around 7 445.Yamane formula was used to determine the population size. Equation is indicated below.

$$n = \frac{N}{1+N\,(e)^2}$$

Were

n = sample size

N =population

e=margin error (0.05)

The sample size obtained after using Yamane Formula is 326. However, the sample size decreased by up to 38 individuals due to a number of factors. The factors which are demographic section, individuals aged below 18 being not eligible to answer the questionnaire hence the sample size decreased. Some homestead parents have gone to work hence a decrease in sample size and also the small-scale farmers are not obliged to answer the questionnaire hence a reduction in sample size.

3.6 Questionnaire

A questionnaire is a research instrument that comprises of series of questions for the purpose of gathering information. It is a kind of written interview which is efficient in acquiring information from a number of individuals (Mcleod & Evans, 2023).Questionaries are going to be used to obtain information on knowledge, attitude and practices towards veld fire amongst small-scale farmers in Manhenga Rural District. The questionnaire comprised of four sections which are demographic, knowledge, attitude and practices. Which constitutes of 32 questions, 72 % of close ended and 28 % of open-ended questions.

3.7 Direct observation

Direct observations, also known as observational studies, is a method of collecting data, in which the subject is watched at a distance in his or her environment. To increase the accuracy of information gathered, both questionnaires and direct observations are used in the research study. The aim is to evaluate ongoing behavior trends and future trends when there are physical features that can be readily seen (Holmes, 2013).

3.8 Data analysis

Statistical Package for Social Sciences version 20 is a software application package used for statistical analysis of information. Provides a range of tools for data management, analysis and reporting. Microsoft excel is also used for data entering and can also be used together with SPSS (Smith & Johnson, 2018).This is particularly used in the analysis of large datasets and in conducting complex statistical analysis. Microsoft Excel is commonly used for data. Microsoft Excel provides with a range of tolls for data analysis, pivot tables, charts and graphs. It can be used to clean and transform data before importing it to SPSS. Data can be imported from Microsoft excel into SPSS for analysis. Data can be copied and pasted directly for excel into SPSS (Smith & Johnson, 2018). Alternatively, the excel file is saved as a CSV (Comma Separated Values) file and then imported into the SPSS application.

3.9 Research variables

Research variables are the elements that are studied in research. In the assessment of knowledge, attitude and practices towards veld fires among small scale farmers in Manhenga Rural District, variables considered are knowledge, attitude, practices and demographic. Knowledge is the level of understanding that small scale farmers have on veld fires, which include causes, prevention and

management strategies when there is a veld fire outbreak (Moyo, et al., 2019).Attitudes are the individual feelings, opinions and beliefs that small-scale farmers have towards veld fires not forgetting perceived risks and benefits. On practices these are actions, behaviors and activities that small scale farmers observe in relation to veld fires. Fire management techniques and compliance with fire regulations. Demographic variables comprise of factors such as age, gender and level of education, which may influence small scale farmers knowledge, attitude and practices towards veld fires (Moyo, et al., 2019).

3.4.0 Research ethics

Principles that guide the conduct of research. In the assessment of knowledge, attitude and practices towards veld fires among small scale farmers, it is vital to consider the following ethical principles. Informed consent, confidentiality, respect for persons and non-maleficence. The researchers are to ensure that the study does not cause harm the participants (Chauke, et al., 2019) .Participants should be fully informed about to the study and provide their voluntary agreement to participate. Permission was granted by the Chairperson in writing to carry out research.

Chapter 4

DATA PRESENTATION AND ANALYSIS

4.0Introduction

This chapter comprises of data analysis and discussion of the findings. Objectives of the study were to assess knowledge of small-scale farmers towards veld fire causes and effects, the standard width of a fireguard and the number of days of notifying neighboring farmers before starting a veld fire for land clearance in Manhenga Rural District. The "Yes" was given a score of 1 while "No" and "I don't know" were given a score of 0. Reponses to questions where (yes=1, No=2, I do not know=3)**.** The data was largely analyzed using percentages and presented using descriptive methods such as pie charts, bar graphs and frequency tables as the study was of a descriptive nature.

4.1Demographic information

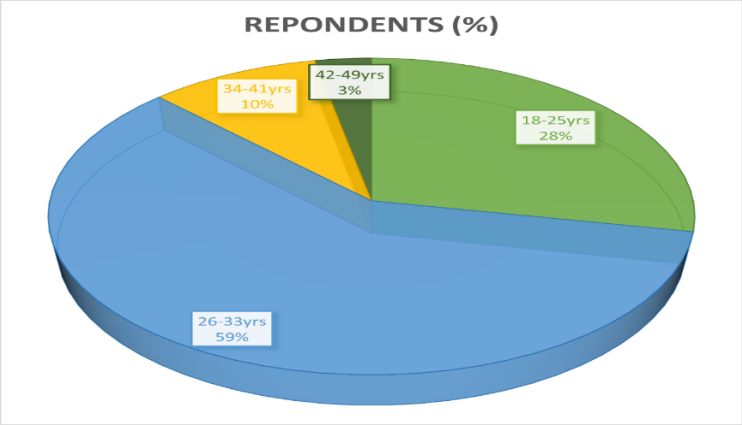
The results attained from the field research carried out at Manhenga Rural on gender ,78.1% were female and 21.9% were male (table 4.1). The percentage of respondents on marital status were 25% single,68%were married,6.3% were widowed. The age group range with the highest percentage of respondents in the field survey, as shown in the table, was 26 to 33 years with 59.4%. Followed by 18 to 24 years with 28.1%, 34 to 41 years with 9.4%. The least percentage of respondents is the age group from 42 to 49 years with 3.1%. Level of education 9.4% primary,87.5% secondary and 3.1% tertiary Participants were small-scale farmers located in Manhenga Rural District.

Table4.1: Socio-demographic information of respondents.(n=38)

Demographic status	**Respondents (%)**
Gender	
Female	78.1
Male	21.9
Marital Status	
Single	25
Married	68

Divorced	--
Widowed	6.3
Age of respondents	
18-25yrs	28.1
26-33yrs	59.4
34-41yrs	9.4
42-49yrs	3.1
Level of education	
Primary	9.4
Secondary	87.5
Tertiary	3.1

Figure4.1Age Respondents in Manhenga Rural District Field Survey

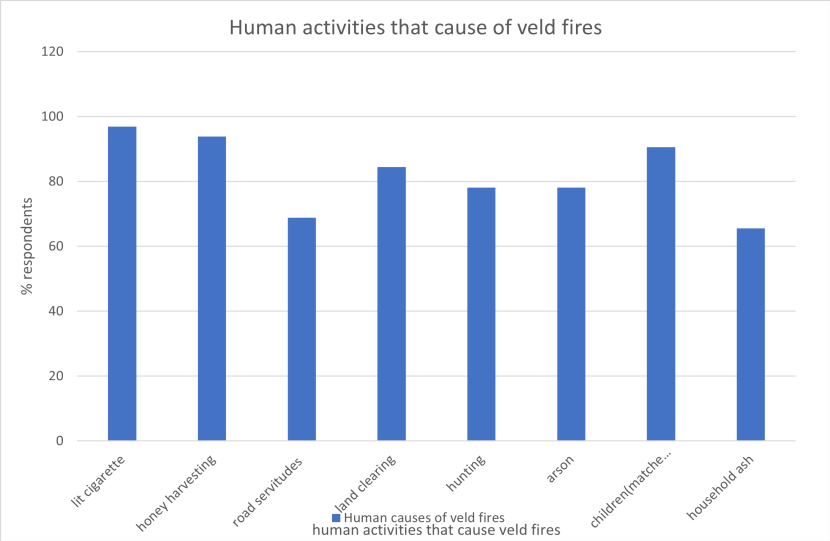


4.2 Knowledge among small-scale farmers towards veld fire

Objective number one of this research was to assess the knowledge of small-scale farmers towards veld fires causes, standard width of a fire-guard, number of days of notifying neighboring farmers before starting a veld fire for land clearance and effects of veld fires. Calculated mean score of 12.09 majority of small-scale in this survey reported to be knowledgeable on the causes and effects of veld fires. Questionnaire comprised of questions on the causes of veld fires, Figure 4.2 shows that the major causes of veld fires are human activities. Arranged by a descending order which involves reckless disposal of lit cigarette with 96.9%, smoking out of bees for honey harvesting with 93.8%, children playing with match sticks with 90.6% and land clearance 84.4%. Followed

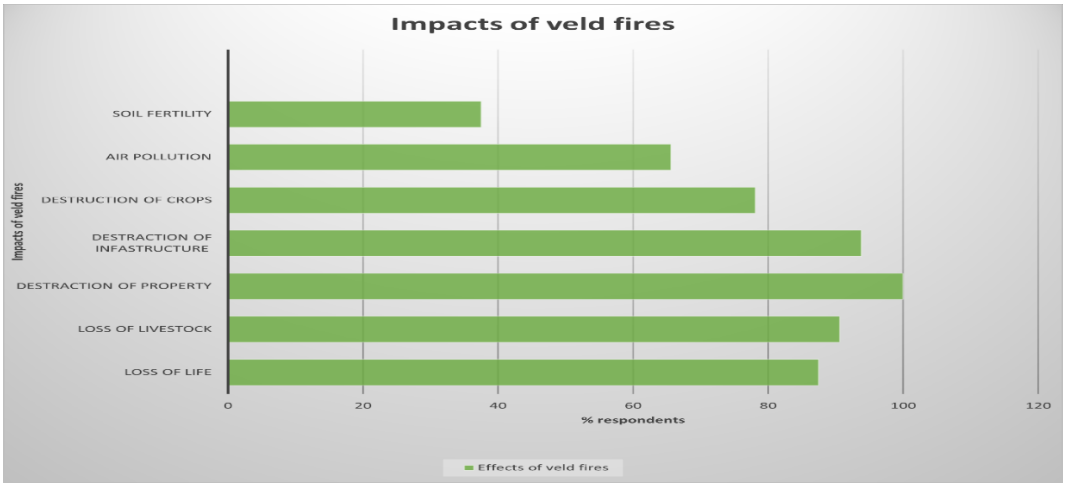
by hunting and arson having the same respondent's percentage of 78.1%, morning buses with 68.8% and lastly disposal of household ash 65.6%.

Figure 4.2: Small-scale farmers activities that cause veld fires



Another question was on the effects of veld fires. All farmers knew when the fire season began but they had no knowledge of the standard width of a fireguard and the number of days of notifying neighboring farmers before starting fire for land clearance. Figure 4.3 indicates the response on the effects of veld fires which are loss of life (87,5%), loss of livestock (90.6%), destruction of property (100%), destruction of infrastructure (93.8%), destruction of crops (78.1%), air pollution (65.6%) and reduced soil (37.5%).

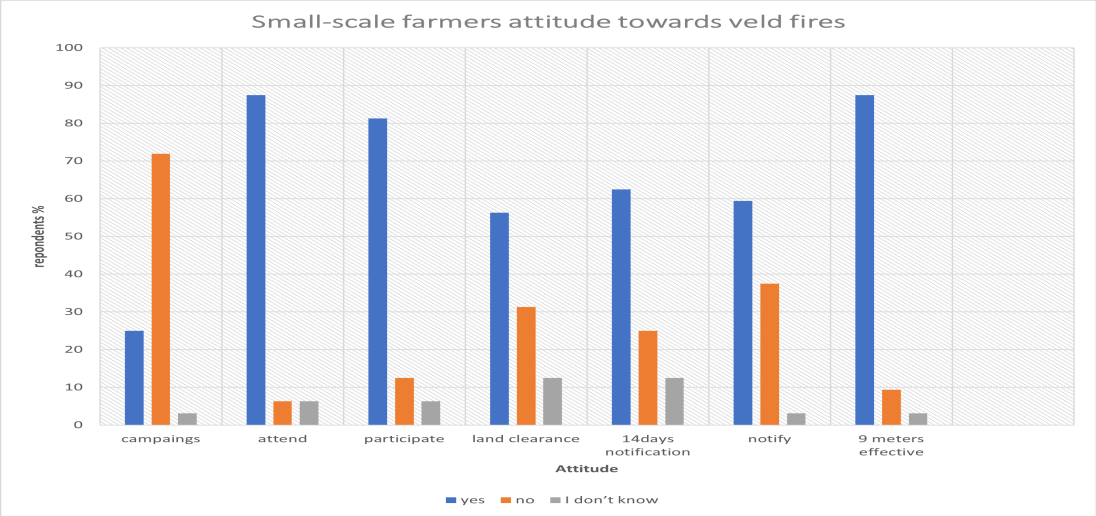
Figure 4.3: Impact of veld fires



4.3Attitudes of small-scale farmers towards veld fires

Objective number two was to determine the attitudes of small-scale farmers towards veld fire. The figure below shows a small-scale ale show a positive attitude towards veld fires (mean attitude score =4.81). The percentage of respondents from small-scale that think fire awareness campaigns are not a waste of time are (71,9%). A percentage of (87.5%) are willing to attend fire awareness campaigns are held in their community, (81.3%) are willing to participate in extinguishing fire in the event of a veld fire outbreak. Small-scale farmers think that veld fires can be used as a method of land clearance (56.3%). Percentage of (62.5%) respondents think that 14days are enough to notify other farmers if the other wants to start a veld fire for land clearance and (59.4%) notify neighbors when they want to lit fire. Lastly, (87.5%) respondents think 9 meters is effective in controlling the spread of veld fires. A percentage of (43.8%) small-scale farmers in Manhenga think that 50 000ZWL (100USA) is too low to be paid by a veld fire offender.

Figure 4.4 Small-scale farmers attitude towards veld fires

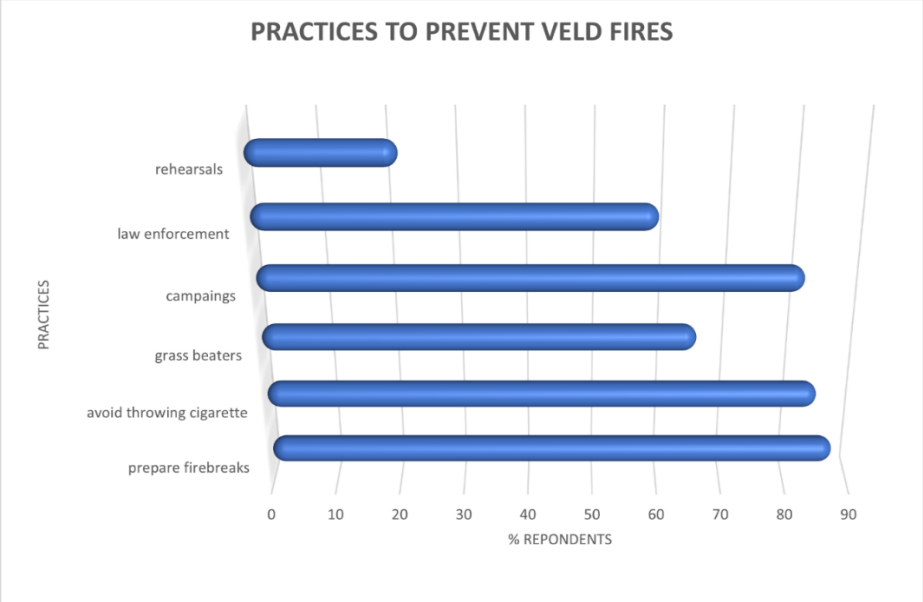


4.4 Practices of small-scale farmers towards veld fires

The third objective was on the practices which are represented in Figure 4.4. Mean score on the practices towards veld fires (mean score 4.657) which indicate a positive attitude. Practices that are being carried out by small-scale farmer respondents in Manhenga Rural District arranged by descending order (87.5%) prepare fire breaks and it was evident as (90.6%) prepared a 2meters firebreaks. Avoid throwing lit cigarette buds on the ground with (84.4%), holding up campaigns

(81.3%) and having a grass beater handy to extinguish veld fire with (65.6%). Followed by Law enforcement (59.4%) and Rehearsals (21.9%). Other practices that are carried are pouring water around the area that the farmer wants to burn so as to inhibit further spread of veld fire. Monitoring their fields especially during burning.

Figure 4.5: Practices to prevent veld fires



4.5 Socio-demographic factors that significantly influence small-scale farmers knowledge, attitude and practices towards veld fires.

Table 4.2: Socio-demographic factors Pearson chi-squared in the KAP survey

Demographic factors	KAP variables	Pearson chi-square value
Gender	Hunting causes veld fire	0.011
	The effects of veld fires are a distraction from infrastructure	0.006
	Would you be willing to attend fire awareness campaigns if they are held in your community?	0.020
Marital Status	Rehearsals /drama are practices that can be done to prevent veld fires	0.035

	$100 is the appropriate amount to be paid by a veld fire offender	0.046
Age	Effects of veld are loss of life (death)	0.023
	9 meters is effective in controlling the spread of veld fires.	0.041
Education	Preparing for fire breaks (slashing and hoeing)	0.043

The following Hypothesis was made:

H0 -there is no association between demographic factor and knowledge, attitude and practices variables

H1- there is an association between demographic factors and knowledge, attitude and practice variables.

If $P>0.05$ reject H1 and Accept H0, if $P<0.05$ accept H1 and Reject H0

As shown in the table above 4.4 there is an association between the demographic factor gender and knowledge causes veld fires with a P-value of (0.011). Male respondents had knowledge that hunting leads to spread of veld fires. Respondents mentioned that hunters especially during the night use fire to trap animals for example Tsuro, hence the rapid uncontrollable spread of fire may lead to veld fires. There is also an association between gender and knowledge that veld fires can lead to distraction of infrastructure with a p-value of (0.006). The majority of respondents were females, which played a vital role in guarding homesteads and livestock. Homesteads being more prone to being destroyed by veld fires as they cannot flee from fire like human-beings and livestock

As shown in the table 4.4, there is a significant association between demographic factor gender and attendance to veld fire campaigns with p-value of (0.020). Female respondents indicated that they would be willing to attend fire awareness campaigns if held in their community and went as far as mentioning that campaigns are held in Manhenga Rural District once or twice per year. In these campaigns, individuals are taught on the causes, effects and prevention of veld fires by the (EMA) Environmental Management Agency. A significant relationship between marital status and variable that $100 is appropriate amount to be paid by a veld fire offender with a p-value of (0.046) Married respondents mention that it is low as distraction can be under changed. Another reason

mentioned was inflation, respondents preferred that it would be appropriate if the offender repaired the effects that would have occurred.

There is a significant association between age and variable that 9 meters is effective in controlling veld fires with a p-value of (0.041). The respondents highlighted that they are preparing firebreaks with the width of two meters hence nine meters is effective in controlling veld fires. There is also an association between education level and practices of land clearance, such as slashing and hoeing can prevent the rapid spread of veld fire with a p-value of (0.043).

Chapter 5

DISCUSSION

5.0 Introduction

This chapter is a discussion between a survey carried out at Manhenga and the information that has been found by other authors on the assessment towards veld fires among small scale farmers locally, continentally and internationally.

5.1 Knowledge among small scale farmers towards veld fires

According to the survey the respondents had a good knowledge regarding veld fires, majority of respondents knew that human activities such as reckless disposal of lit cigarettes studs 96.9%, smoking bees out of trees for honey harvesting 93.8%, lighting fires along the road to keep warm while waiting for morning buses 68.8%, land clearance 84.4%, hunting for rabbits 78.1%, arson 78.8%, children playing around with matches sticks, 90.6% and improper disposal of house-hold ash 65.6%.

The human activities that cause of veld fires were cited as hunting, honey harvesting 84 %, burning of crop residues and land preparation 80%. Arson cited by 61% respondents (Chinamatira , et al., 2016).Other causes of wildfires that were highlighted were fire from roadside servitudes 60%,lit cigarettes stubs 51%,burning of rubbish pits and land clearing for settlement 39 %.Some of the underlying causes of veld fires are hunting, farm preparation, local beliefs/taboos, dry wood cravings, rock breaking, pedestrian camp fire, honey harvesting and arson (Kilawe, et al., 2020).

Respondents had good knowledge of the effects of veld fire which are loss of life, loss of livestock, damage to property, distraction of infrastructure, distraction of crops and air pollution (87.5%, 90.6%,100%, 93.8%, 78.1% and 65.6% respectively). Impacts of wildland fires in Chakari 16.1 experienced losses as a result of wildland fires.80% respondents indicated that wild fires destroyed their vegetables and gardens. Farmers lost 13 fowl valued at $78 due to veld fires (Chinamatira , et al., 2016)

5.2 Attitude towards veld fires

According to a study carried out in Manhenga Rural District 71.9% of small-scale famers did not think that fire awareness campaigns are a waste of time and 87.5% of respondents were willing to attend fire awareness campaigns if they are held in their community. In the event of a veld fire outbreak, 81.3% small-scale farmers are willing to participate in extinguishing the veld fire. A percentage of respondents 56.3% do not agree that veld fires can be used as a method of land clearance. According to the study carried out 62.5% of small-scale farmers in Manhenga rural district think that 14 day is enough to notify other farmers if one wants to start a fire for land clearance. A percentage of 59.9% notify neighboring farmers when they want to start a veld fire. Also, a significant percentage 87.5% of small-scale farmers think that nine meters is effective in controlling the spread of veld fires.

Majority of respondents, 69% poor community participation in issues of fires and 51% indicated that difficulty in catching criminals that deliberately cause veld fires is a challenge in policing wildland fires (Chinamatira , et al., 2016). Small-scale farmers' attitudes to veld fires vary based on individual experiences. A research study carried out by (Mhlanga, et al., 2019) indicated that in Zimbabwe small-scale farmers viewed veld fires as a problem that resulted in the damage of their crops, pasture, and livestock. Small-scale farmers also did let out their concerns about the negative impact that veld fires cause on soil fertility and water sources. In Nigeria, Osabuohien found that small-scale farmers had a negative attitude towards veld fires. It is believed that veld fires were caused by human activities such as bush burning and cigarette smoking (Osabuohien, et al., 2020).It is crucial to note that small-scale farmers may also use fires as a tool to clear land for cultivation and promote the growth of new grass for livestock grazing. It is known as controlled burning, and can assist small-scale farmers in maintaining their agricultural production and livelihoods.

5.3 Practices towards veld fires

Practices that are being carried out by small-scale farmer respondents in Manhenga Rural District arranged by descending order (87.5%) prepare fire breaks and it was evident as (90.6%) prepared a 2meters firebreaks. Avoid throwing lit cigarette buds on the ground with (84.4%), holding up campaigns (81.3%) and having a grass beater handy to extinguish veld fire with (65.6%) use masanzu. Followed by Law enforcement (59.4%) and Rehearsals (21.9%). Other practices that are

carried are pouring water around the area that the farmer wants to burn so as to inhibit further spread of veld fire.Small-scale farmers widely use numerous practices to manage and prevent veld fires, depending on local knowledge and resources. Practices include controlled burning, firebreaks, and early warning systems. Controlled burning is a widely known practice among small-scale farmers used for land clearance for cultivation as well as to promote the growth of new grass for livestock grazing (Mhlanga, et al., 2019).Burning dry grass and weeds, small-scale farmers can construct firebreaks that reduce the risk of uncontrolled spread of wildfires. However, this practice requires detailed planning and monitoring to avoid unwanted consequences, such as soil erosion and damage to wildlife habitats.

Firebreaks are listed among other practices used by small-scale farmers to prevent the vigorous spread of veld fires. Fire breakers refer to strips of bare ground that act as a hindrance to slow or stop the spread of a wildfire. Small-scale farmers may slash a strip of land around fields, homes, or livestock to create a firebreak. Also, natural features such as rivers or rocky outcrops can be used as firebreaks (Munyati & Muzemu, 2020).Early warning systems are also vital for small-scale farmers to hinder and manage veld fires. These may comprise of community-based fire patrols, radio broadcasts, or mobile phone alerts. Early detection and rapid response can help small-scale farmers contain a fire before it spreads out of control (Mugabe & Chipindu, 2021).

Chapter 6

CONCLUSION AND RECOMMENDATIONS

6.0Conclusion

Human activities are the leading causes of veld fires outbreak in Manhenga Rural District in Zimbabwe. The farmers are aware that use of fire for land clearing can result in veld fire and it is highly prohibited but they continuously use fire due to ignorance. In Manhenga, household ash are disposed of in dug pits, hence reducing fire outbreaks. There are less cases where a veld fire would be caused by a natural phenomenon. The major human activity that causes veld fires is the reckless disposal of lit cigarettes with 96.9%.

Knowledge of farmers on veld fire is being influenced by Community awareness (Mbuya-Utanho teaching people to dig pits for ash disposal and Environmental Management Agency (EMA) through conducting educational awareness. Majority of the small-scale farmers did not know the standard width of a fire, the farmers constructed fire breaks with the width of 2 meters. The farmers had a good knowledge of the month when the fire season started. Women also had good knowledge, positive attitude and good practices towards veld fires.

Calculated mean score (12.09) majority of small-scale farmers had knowledge on causes and impacts of veld fires. Mean attitude score of (4.81) on attitude of small-scale farmers towards veld fires which was fair Mean score (4.675) on practices towards veld fires which was fair. . Attitudes towards veld fires was poor but the small-scale farmers are willing to attend and learn. Practices were also poor towards veld fires. Adoption of disposal of house-hold ash into dug pits in close proximity to the homestead reduces the occurrence of veld fires.

6.1 Recommendations

With the conclusion drawn above, below are the recommendations

- Community to be all hands-on deck in catching individuals who hunt using fire as well as individuals that discard cigarette buds and report them to the police station
- Adopt and practiced food for work were farmers construct fire breaks in their community
- Small-scale farmers to stop using fire as a method of land clearance.

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Appendices

Appendix 1: Research Questionnaire

I am **Munashe Nikisi** a student at Bindura University of Science Education. Studying for a Bachelor of Science Honors Degree in Safety Health and Environmental Management. It the institution requirement that I carry out a research project, approved by the University authorities' topic is:

An assessment of knowledge, attitude and practices towards veld fire amongst small scale farmers in Manhenga Rural District.

All information you shall give will be only for this academic research and will be treated confidentially.

Instructions to Participants

- *Tick on the appropriate answer and fill in where ever possible*
- *Do not write your name on any of the paper*

Section A: Demographic Data

1.**Sex** Female ☐ Male ☐

2. **Marital Status Single** ☐ Married ☐ Divorced ☐ widowed ☐

3.**Age of respondent** 18-25yrs ☐ 26-33yrs ☐ 34-41 ☐ 42-49 ☐ 50+ ☐

4.**Level of Education** Primary ☐ Secondary ☐ Tertiary ☐

Section B: Knowledge

5.What are the natural causes of veld fires?

a. Lightning strikes
b. Empty glass bottles or pieces of broken bottle
c. High temperatures
d. Under-ground heat from coal

Other natural causes of veld fires

……
……
……

6.What are the human causes of veld fires?

e. Reckless disposal of lit cigarette studs
f. Smoking out of bees for honey harvesting
g. Lighting fires at road servitudes while waiting for early morning buses
h. Land clearing
i. Hunting
j. Deliberate lighting of fires/arson
k. Children playing with matches
l. Improper household ash disposal

Other human causes of veld fires?

……
……
……

7.In which month does the fire season begin?

……

8.What is the standard width of a fireguard?

……

9.What are the methods that you use for land clearance?

……

10.What is the fine paid for causing veld fire?

……

11.State the number of days of notifying neighbouring farmers before starting a veld fire for land clearance?

……..

12.What are the effects of veld fire?

a. Loss of life
b. Loss of livestock
c. Damage to property
d. Distraction of houses /infrastructure
e. Distraction of crops e.g., maize yields
f. Air pollution
g. Reduce soil fertility

Other effects of veld fires?

……
……
……

Section C: Attitude

13.Do you think fire awareness campaigns are a waste of time?	**Yes** ☐ **No** ☐ **I don't know** ☐
14.Will you be willing to attend fire awareness campaigns if they are held in your community?	**Yes** ☐ **No** ☐ **I don't know** ☐
15.In the event of a veld fire outbreak are you willing to participate in extinguishing the fire?	**Yes** ☐ **No** ☐ **I don't know** ☐
16.Do you think veld fires can be used as a method of land clearance?	**Yes** ☐ **No** ☐ **I don't know** ☐
17.Do you think 14 days is enough to notify other farmers if the other wants to start a veld fire for land clearance?	**Yes** ☐ **No** ☐ **I don't know** ☐
18.Do you notify your neighbours when you want to start fire?	**Yes** ☐ **No** ☐ **I don't know** ☐
19.Do you think 9 meters is effective in controlling the spread of veld fires	**Yes** ☐ **No** ☐ **I don't know** ☐

20.Do you think $100 is the right amount to be paid by a veld fire offender?

high ☐ low ☐ I don't know ☐

if your answer is high/low, why do you say so and state the amount that you think is appropriate?

……
……

Section D: Practices

21.What can be done to prevent veld fires?

a) Prepare fire breaks (slashing and hoeing) ☐
b) Avoid throwing cigarette buds on the ground ☐
c) Have grass beaters handy to extinguish the fire ☐

d) Campaigns
e) Law enforcement
f) Rehearsals

22.Other measures that can be put in place to prevent veld fires?

……
……
……

23.Do you attend fire awareness campaigns? Yes No

If your answer is No, why don't you attend fire awareness campaigns?

……
……

24.What was the width of a fire guard that you recently constructed?

……

25.Have you ever paid a fine for causing veld fires? Yes No

If your answer is Yes, how much did your pay?

……..

24.Do you use fire as a method of land clearance? Yes No

If your answer is yes, why?

……
……
……

25.What are the actions that you take in the midst of a veld fire?

a) …….

b) ……

c)……..…

d)…….….

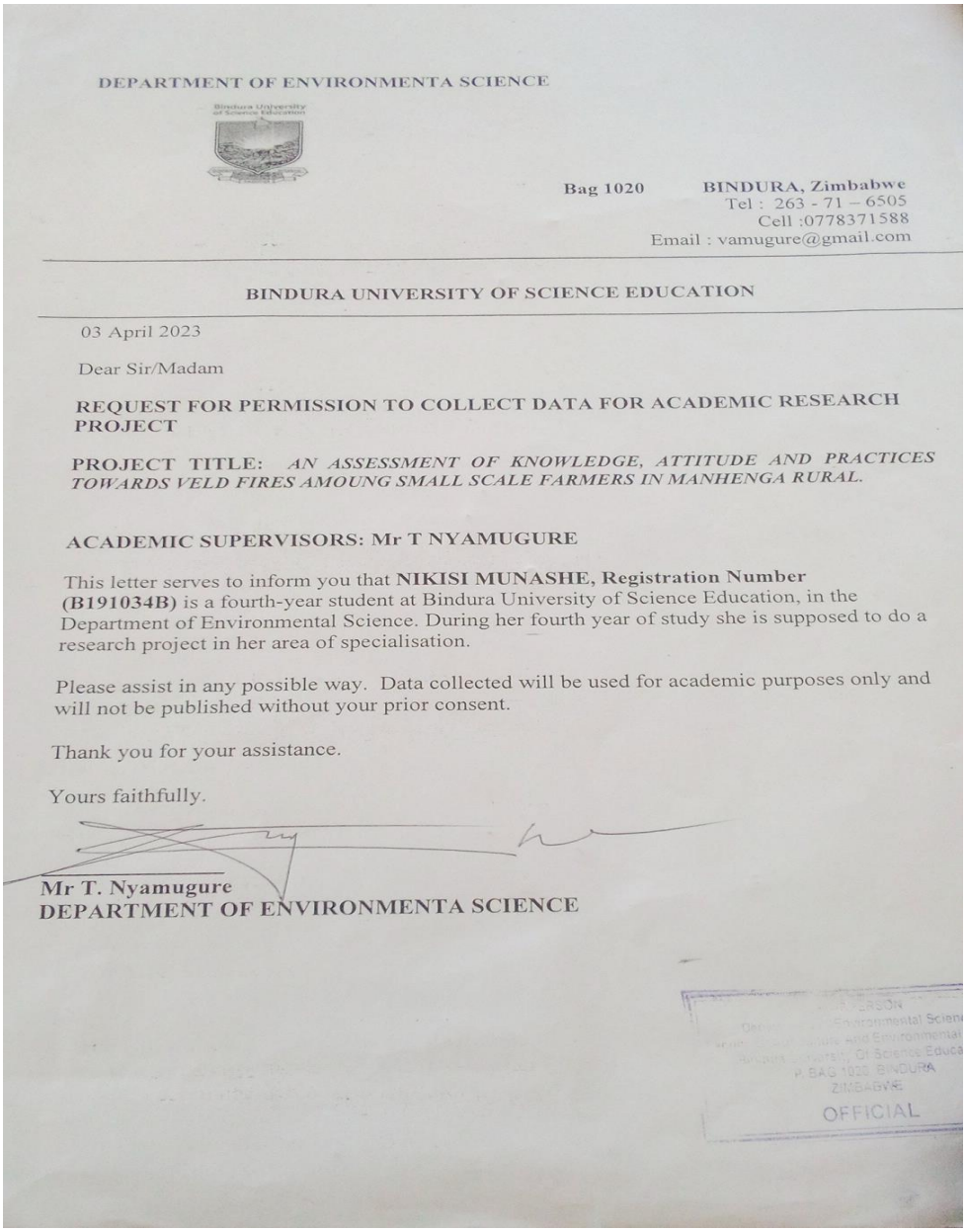
26.Have you ever helped your neighbors in the event of a veld fire outbreak?

……

……

Thank you.

Appendix 2:Approval letter



DEPARTMENT OF ENVIRONMENTA SCIENCE

Bag 1020 BINDURA, Zimbabwe
Tel : 263 - 71 – 6505
Cell :0778371588
Email : vamugure@gmail.com

BINDURA UNIVERSITY OF SCIENCE EDUCATION

03 April 2023

Dear Sir/Madam

REQUEST FOR PERMISSION TO COLLECT DATA FOR ACADEMIC RESEARCH PROJECT

PROJECT TITLE: ***AN ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS VELD FIRES AMOUNG SMALL SCALE FARMERS IN MANHENGA RURAL.***

ACADEMIC SUPERVISORS: Mr T NYAMUGURE

This letter serves to inform you that **NIKISI MUNASHE, Registration Number (B191034B)** is a fourth-year student at Bindura University of Science Education, in the Department of Environmental Science. During her fourth year of study she is supposed to do a research project in her area of specialisation.

Please assist in any possible way. Data collected will be used for academic purposes only and will not be published without your prior consent.

Thank you for your assistance.

Yours faithfully.

Mr T. Nyamugure
DEPARTMENT OF ENVIRONMENTA SCIENCE

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