RELIGION AND ECOLOGY: CLIMATE CHANGE BETWEEN CHRISTIAN AND SHONA RELIGIOUS BELIEFS AND PRACTICES

BY

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May the power greater than any of us, the power spoken through the ages in Psalms 23, … even though I walk through the valley of the shadow of death, I shall fear no evil…, continue to guide and protect you.

I thank you and God bless you all.

Dedication

I dedicate this study to wife Catherine and my two kids Tanatswa and Mukudzei.

Declaration

I Muza Kudakwashe declare that this research is my own work and has not been submitted for examination to a different university besides the University of Pretoria.

Signed ……

Date ……

Definition of terms

Adaptation: the adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts (UNFCCC: 2012).

Climate: a measure of the average pattern of variation in temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle content and other meteorological variables in a given region over long periods of time. The standard averaging period is thirty years (WMO: 1990).

Climate change: the change in statistical distribution of weather patterns when that change lasts for an extended period of time that is from decades to millions of years (American National Research Council 2010). Climate change may also refer to a change in average weather conditions or variation of weather conditions. A change that occurs in global or regional climate patterns in particular a change apparent from the mid to late twentieth century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels (ibid). However, in this context the term is used to refer to anthropogenic climate change that is caused by human activity as opposed to climate change that results from the earth's natural processes.

Ecology: is the scientific analysis and study of interactions between living organisms and their environment (Heywood 2007:258). It developed as a distinct branch of biology through a growing recognition that plants and animals are sustained by self-regulating natural systems composed of both living and non-living elements (ibid).

Global warming: is the observed century scale rise in average temperature of the earth's climate system and its related effects (American National Research Council 2010). It is also the increase of the earth`s average surface temperature due to the effects of greenhouse gases such as carbon dioxide emitted from the burning of fossil fuels or from deforestation which trap the heat that would otherwise escape from the earth (www.nmsea.org).

Mitigation: is the process of reducing greenhouse gas emissions and attempting to remove the greenhouse gases that have already been emitted into the atmosphere (Toroitich and Kerber 2012:296).

Religion: having taken into consideration the problems associated with defining the term religion, this study provides a working definition. Religion, "is a varied, symbolic expression of, and appropriate response to, that which people deliberately affirm as being of unrestricted value to them" (Cox 1998: 15).

Sustainable development: is the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs (Toroitich and Kerber 2012:297-299). According to Santa Ana (1998:5), sustainable development implies concern for the well-being of future generations and their right to a fulfilled life.

Ex-nihilo: is the Latin word which means that out of nothing God created the world.

Mafukidzanyika: is a Shona term which refers to the planting of indigenous trees and grasses to cover the bare earth.

Makawa: these are small pits dug on the ground and seeds are planted there.

Mwari: is the Shona name for God.

Mitupo: these are totems.

Mukwerera: is a traditional rain-making ceremony conducted in a bushy area under a big sacred tree especially *Muhacha* tree.

Muhacha: is a sacred tree in Shona religion.

Homo sapiens: is the species that all living human beings on this planet belong to (humanorigins.si.edu).

Acronyms

AZTREC	Association of Zimbabwean Traditional Ecologists.
ATR	African Traditional Religions.
DNA	Deoxyribonucleic acid.
CCJP	Catholic Commission for Justice and Peace.

EMA Environmental Management Agency.

IPCC Intergovernmental Panel on Climate Change.

MDC Movement for Democratic Change.

MDG Millennium Development Goals.

NRCCNAES National Research Council Committee on Nuclear and Alternative Energy Systems.

UNCED United Nations Conference on Environment and Development.

UNFCCC United Nations Framework Convention on Climate Change.

UV Ultra-violet rays.

WMO World Meteorological Organisation.

ZANU PF Zimbabwe African National Union Patriotic Front.

Contents

Acknowledgements ii
Dedication iii
Declaration iv
Definition of terms v
Acronyms vi
Contents viii
List of Figures and Tables xi
Abstract xiii
Chapter 1 1
1.1 Introduction 1
1.2 Background to the study 1
1.3 The research problem 4
1.4 Research Objectives 5
1.5 Research questions 6
1.6 Justification 6
1.7 Hypothesis 8
1.8 Methodology 10
1.9 Scope and limitations of the study 16
1.10 Chapter outline 17
1.11 Overview of existing Literature 17
Chapter 2 18
Review of related literature 18
2.1 Introduction 18
2.2 Literature review 18
2.3 Causes of global warming and subsequent climate change 24
2.4 Impact of global warming and climate change 34
2.5 Impact of climate change on food production 36
2.6 Impact of climate change on fresh clean water 37
2.7 Impact of climate change on human health and diseases 37
2.8 Human settlements, energy and industry 38
2.9 Impact of climate change on insurance and financial services 39
2.10 Impact of climate change on poverty reduction 40

2.11 Conclusion 42
Chapter 3 44
The land and its people 44
3.1 Introduction 44
3.2 Description of the area under study and its inhabitants 44
3.3 Climate and vegetation 45
3.4 Demography and livelihoods 47
3. 5 The Shona people 52
3.6 Shona traditional polity 56
3.7 The Shona people's attitudes to nature 57
3.8 The Shona religious and sacral view of land and water 61
3.9 Christian attitudes to the environment: Background issues 68
3.10 Activities done by Shona people in response to climate change impacts 72
3.11 Conclusion 76
Chapter 4 77
Research findings 77
4.1 Introduction 77
4.2 The wounded earth 77
4.3 Unsustainable population growth 78
4.4 Religious fundamental roles in environmental conservation 80
4.5 Indigenous Knowledge Systems (IKS) and Weather Indicators 85
4.6 The role of Traditional leaders 93
4.7 Diverging world views and perspectives between Christianity and Shona religions 96
4.8 Scientific Weather Indicators 99
4.9 Notable barriers to effective climate change mitigation and adaptation 100
4.10 Conclusion 113
Chapter 5 115
Evaluation 115
5.1. Introduction 115
5.2 The Interface between Religion, Science and Sustainable Development 115
5.3 Religious conservatism 120
5.4 Religion as a climate change coping mechanism 121
5.5 Sustainable Development in the face of Industrialization and Globalisation 125

5.6 Historical successes of Religion in correcting human wrongs 127
5.7 Religious contributions to climate change mitigation 129
5.8 The way forward: Towards a common environmental goal 133
5.9 Moral aptitude: The climate game changer 134
5.10 Shared ideology 137
5.11 Mitigation strategies to avert climate change 139
5.12 Conclusion 163
Chapter 6 164
Recommendations and conclusion 164
6.1 Introduction 164
6.2 Summary of findings and recommendations 164
6.3 Limitations and areas needing further research 168
6.4 Conclusion 169
Bibliography 171
Articles in Journals and books, Journals, Reports and Newspapers 174
Newspaper articles 176
Online sources 177
Interviews 179
Interviewees Date of interview 179
Unpublished sources 180
Atlases 181
Appendix 1: Semi-structured questionnaires 182
Personal details 182
Weather information 182
Livelihoods 183
Appendix 2 184
Focus Group Discussions 184
Appendix 3 185
Key Informant Interviews 185
LETTER OF INTRODUCTION AND INFORMED CONSENT 187
WRITTEN INFORMED CONSENT 189
VERBAL INFORMED CONSENT 190

List of Figures and Tables

Figure 1.1 Human activities are the main causes of anthropogenic climate change……2

Figure 2.1 Breakdown of heat-trapping emissions by economic sectors……25

Figure 2.2 Loss of vegetation in Zimbabwe between 1992 and 2008……28

Figure 2.3 Statistical data on land use in Zimbabwe……29

Figure 2.4 Statistical representation of land lost to agriculture and settlement in Zimbabwe……30

Figure 2.5 Piles of wood to cure tobacco at a local farm in Hurungwe……34

Figure 2.6 Rural and poverty stricken community in Hurungwe……41

Figure 3.1 Provincial boundaries of the area inhabited by Shona people……44

Figure 3.2 Climate conditions of the area understudy……45

Figure 3.3 2017 tobacco crop under irrigation……49

Figure 3.4 Vendors selling firewood in Mabvuku high density suburb in Harare……52

Figure 3.5 Mukuvisi Woodlands……59

Figure 3.6 Ward 19 Councillor showing people a trail of destruction by veld-fires……74

Figure 3.7 Gum-trees planted in Hurungwe district……75

Figure 4.1 Mining activities destroying the environment……78

Figure 4.2 After remaining stable for many centuries, human population swelled heavily from 1800……79

Figure 4.3 Cash crops getting more preference than food crops……87

Figure 4.4 Views of the young and old generations between scientific and traditional knowledge systems……87

Figure 4.5 Sorghum crop grown in drought prone Midlands province……89

Figure 4.6 Late maturing maize crop planted in November 2017 hit by dry spell and late rains……90

Figure 4.7 Early maturing maize crops planted late in January 2018……91

Figure 4.8 Mugan`acha tree with more fruit, an indication of late rains……92

Table 4.9 Outcomes from tree appearances and fruiting gathered from F.G. Ds held on 04/12/18……93

Figure 4.10 200 hectares of virgin land cleared to increase tobacco hectarage……105

Figure 5.1 Lack of collaboration between natural sciences, politics and religion……123

Figure 5.2 The much needed collaborative approach in climate change mitigation……124

Figure 5.3 A once densely forested area slowly giving in to farming in Mashonaland East province……142

Figure 5.4 Population growth pattern between developed and poor countries……143

Figure 5.5 Percentage numbers of population per religion in the world……145

Figure 5.6 Dangerous chemicals leaching into the ground……152

Figure 5.7 Mechanical land preparation……160

Abstract

The biggest single threat to ecology and bio-diversity on planet earth is the human induced climate change. Global climate disruption due to the build-up of carbon dioxide and other gases in the atmosphere is rising. This study therefore assesses some attitudes for coping with climate change as it has been necessitated by the realisation that climate has been changing drastically in the past decades onwards. Agriculture as the main source of livelihood in Zimbabwe and the whole of Africa has been greatly affected by the climatic changes of geological proportions since coping mechanisms are very poor. Much of Zimbabwe's agricultural production is rain fed and the erratic manner in which rain has been falling is cause for concern among many people. Disease outbreaks are on the rise since the world is experiencing severe temperature rises. Droughts and floods are also on the rise. If the world is to take necessary actions to address the causes, impacts of climate change and related issues in an effective and definitive way, religious considerations must be taken into account. The pivotal role of religion in issues of climate change and environmental conservation hinges solely on religious functions in society, ethical teachings and religion's ability to inspire its adherents to take environmentally friendly attitudes towards nature. Religion's capacity to compel people to action, providing an understanding of the intrinsic value of nature and encouraging positive responsibility towards all creation is explored in this study since religion has the potential to provide solutions to the climate change crisis. Amongst the findings of this study is that there is a paradoxical relationship between religion and nature where religions play pivotal roles in encouraging, sustaining and engendering lasting and constructive solutions towards the environment.

Key words: Religion, Ecology, Climate, Climate change, Global warming, Adaptation, Mitigation, Sustainable development.

Chapter 1

1.1 Introduction

Issues of environmental ethics continue to make news in different parts of the world. There has been striking changes in climate patterns in the past decades. Currently, issues of global warming, dependency on fossil fuels especially in upcoming economies releasing large amounts of carbon dioxide and ultra-violet radiation that threaten humanity's survival and that of wildlife and plants, deforestation especially in developing countries, pollution of air, earth and water, population growth, the proliferation of nuclear, biological and chemical weapons of mass destruction among many more are on the rise. Of major concern is the permanent damage posed by pollution that can never be made good like the extinction of plants and animals that humanity is witnessing and the trend is set to rise even more in the decades to come if action is not taken now. Long lived pesticides and perhaps weed killers are eliminating animals and plants far from the site of application particularly in deep Seas and Oceans (Colin Vaux 1993:19). Different schools of thought have tried to identify causes as well as solutions most of which are scientific in nature. Attempting to provide answers to the problems of climate change requires an all-inclusive approach. Since the whole world is looking for solutions to address the challenges leading to climate change chiefly due to global warming, religious actors need to be accorded space in policy making. It is thus the task of this study to explore the adaptive strategies for coping with climate change by looking at those religious beliefs and practices in Christianity and Shona religions and formulate an eco-friendly ethic that proffers a positive attitude to nature. Having done this much, recommendations will be offered on the possible ways in which religious traditions can be recruited in the fight to save the environment for posterity.

1.2 Background to the study

Morden civilizations are colliding violently with the earth's ecological system whose natural balance continue to be compromised. Human activities are causing severe environmental damage at an alarming rate. Established development patterns of thought are so deep rooted to the extent that it is becoming difficult to move to sustainable development where production is done at low or no carbon emission. Humanity is on a destructive path that without frantic efforts to halt it, life on planet

earth is under threat. The major problem is that, despite the availability of technologies and practical solutions being offered by Scientists to correct the environmental wrongs, no meaningful action is being taken.

Figure 1.1 Human activities are the main causes of anthropogenic climate change with America raked as the top polluter of the atmosphere.

Source: https://www.ucsusa.org.

The ferocity of human assault on planet earth is so breath-taking and the horrific consequences are occurring so quickly as to defy human capacity to recognise them, comprehend their global implications and organise an appropriate and timely response (Gore 2007:269). In view of this fact, this study assesses the way in which Christianity and Shona religious beliefs and practices can contribute to strategies to cope with climate change. The ways in which these religions can propose positive attitudes towards nature and promote sustainable developmental programmes are under investigation. This is based on the understanding that God's creation was made good (Genesis 1:10, 18, 21, 25, 31). The only thing that was not good in the sight of God was that Adam was alone. As a result of human interference with nature the design and intention of God in creation was disturbed. Further due to human interference with nature the climate has been changing rapidly in the past decades. The changes have been drastic and visible raising concerns among many people in the world. Humanity in her developmental and territorial expansion programmes played a role in the degradation of the environment. Religion also played its part in

the degradation of the environment. White (1969:42-47) puts it as follows, “the very roots of our ecological crisis are religious”. The world now faces major problems relating to nature, global warming, ozone depletion, earth, water and air pollution and the very threat to the survival of humanity and animal species on planet earth. This does not engender confidence in the ability of science to solve these problems. Clearly one cannot fault natural sciences for lacking efforts because there have been many attempts to try and account for and offer solutions to these problems however the attempts have not produced definitive solutions. Having realised that humanity and the environment in particular can no longer wait for natural sciences alone for climate change solutions and answers, scholars from different fields of humanities have decided to make the environment and its attendant problems a multi-sectoral and multi-disciplinary challenge for the long term survival of all living species in the universe. The environmental problems outlined above are no longer some abstract issues but they are now issues of life and death therefore everyone must make a contribution to finding lasting solutions to these challenges. It is in this respect that a great number of scholars of religion have started raising questions on the possible impact and influence of religious teachings in engendering and nurturing people’s attitudes towards nature.

Religion stands accused of being the invisible force behind man’s destructive attitudes towards nature that have led to destructive actions by humans towards the environment. While some religious considerations may have been responsible for some of the destructive attitudes towards nature alongside political and economic considerations, humanity must be careful to avoid sentimentalism which will cloud our judgement in a bid to try and reduce the impact of climate change. There is clearly a paradoxical relationship between religion and the environment in as much as religions may have contributed to the depletion of the environment. In fact, it is interesting to note that while politics and economics are given room to rectify their own wrongs seen through the attempts to come to some political deals, incentivising nations that comply with agreements signed on climate change and the funding for the fight against these problems. Religion seems not to have been allowed the same benefit as is the case with the Politics and Natural sciences to make binding resolutions in world climate governance. This study therefore is driven by the desire

to identify and compare the contributions especially those dimensions that are foundational in a sustainable attack against the environmental problems that threaten the long term survival of planet earth. Religions can evoke a kind of awareness in people that is different from scientific or technological reasoning. Religions of the world in their diversity each offers a unique set of moral values and rules which can guide human beings in their relationship with the things around them. Therefore, the study of these beliefs and practices towards the environment from a religious perspective is thus of greater significance (Dwivedi 1993:19). As such, this study therefore seeks to bridge the gap between natural sciences and religiously based belief systems and practices and discover how they can be of help in mitigating the effects of climate change.

1.3 The research problem

For the past two decades, issues of the state of the continuous environmental degradation have been on the rise. Locally, it has been the scarcity of rainfall or the excessive manner in which rain has been falling. Temperatures are gradually rising. Natural disasters have become more severe and frequent. Pollution of water bodies, massive deforestation, poaching and droughts have become frequent episodes nowadays. It is evident that the problem of the environment seems to have been "privatised" into an issue for the natural sciences alone. It has been propagated widely that the explanations for these problems could be provided by the scientific study of the environment and even the solutions were thought of as only viable when proffered by the natural scientists. With the passage of time, it seemed science had some solutions but certainly not all solutions. In fact, judging by the worsening of the situation in the world, one can argue that science alone has failed to address these problems. With natural science leading the way, the warming of the earth seems to be unstoppable with no definitive solutions. While this study highlighted some local problems, these are in fact local illustrations of a universal problem. In the Far East violent weather has become frequent in the past decades, the frequency of monsoon rains and storms continue to rise. More so, in Australia and California in the United States of America for example have seen frequent bursts of wildfires. Tornados in Florida in September 2017 destroyed the natural ecosystems, properties and human life. These disasters have become the normal news on most of the international

news channels. The environmental problems that continue to confront the world today are on the rise. It has been noted that these environmental problems which continue to be on the rise have been blamed on humanity. Even though the situation is already bad as outlined above, the problems are certainly not subsiding but they are getting worse. Temperatures are gradually increasing. This is evidenced by the continued sea level rise, droughts and heat waves which are frequent (Raygorodetsky 2011). It has become increasingly clear that what has been named the ecological crisis has become number one problem facing the entire world. It is a problem affecting all human beings regardless of nationality, race or religion. Humanity is now engaged in an epic battle to correct the wrongs done to the environment but there is no coordinated effort, a major blow to the global efforts to save the environment from irreversible effects of global warming. Success in this battle will only be realised when the majority, in fact all the people in the world are sufficiently aroused by a shared sense of urgent danger that living species are facing. Having realised that, this study therefore seeks to bridge the gap between natural sciences and religiously based belief systems and practices and discover how they can be of help. As such, the question that this study seeks to address is: What role does religion and its attendant teachings have to offer humanity in curbing the effects of the changing climate?

1.4 Research Objectives

This study shall address the aim of this research through the following broad objectives as outlined below:

1.4.1 To investigate and analyse the impact of Christian and Shona religious beliefs and practices in mitigating the effects of climate change in Zimbabwe.

1.4.2 To reconstruct the life setting of the Shona people, their beliefs, practices and attitudes to nature.

1.4.3 To explore adaptive strategies to cope with the Climate Change problems.

1.4.4 To evaluate Christian and Shona religious attitudes, belief systems and practices in coping with Climate Change.

1.4.5 To recommend what humanity must do to prevent further damage of the planet earth and to give concluding remarks.

1.5 Research questions

What role can religion play in climate change mitigation? How can Christian and Shona religious beliefs and practices be tapped in a bid to cope with climate change in Zimbabwe? What strategies can Christian and Shona religions offer in climate change mitigation?

1.6 Justification

Religion, as broadly defined by Hall, Pilgrim and Cavanaugh in Cox (1998:15), "is a varied, symbolic expression of, and appropriate response to that which people deliberately affirm as being of unrestricted value to them", must be brought to bear in using its influence, raising public awareness of the imminent danger the world is facing and urging a collective course of action. Naturally the atmosphere and Oceans respond to the unevenly distributed driving force of energy from the sun's radiation storing, redistributing and reemitting it in different ways. The dynamic and thermo-dynamic manifestations of these responses are seen instantaneously as weather. Viewed over long spans of over thirty years, these responses are described as climate (Pittock, Flakes, Jennsen, Peterson and Zillman 1978: 47). Every quantifiable element of weather such as temperature, pressure and rainfall varies continuously or discontinuously with time on all time scales so that an essential aspect of climate is experienced. However, these changes due to human interference have become drastic and frequent with temperature surges and erratic rainfall patterns being experienced the world over. Hence in the past decades, many people have been searching for solutions to save the world from the dangers posed by climate change and ways to adapt to the current reality of climate change. However, many of the solutions proffered are scientific in nature without looking at possible ways that religion can offer to try and adapt to the climate change menace. It is therefore justified for this study to undertake an exploration of adaptive strategies to cope with climate change from a religious perspective since religion, as observed by White (1969:46) that, "it has contributed to the degradation of the environment and as such should also be part of the solution to the prevailing problems".

As the world's population edges closer to 10 billion people, effects on world food production and to the full utilisation of fresh water supplies will be disrupted. "Profound cultural and philosophical questions are being raised as to the proper relationship between humanity and nature. Should the world accept the limitations imposed by the natural climate on food production and water supply or should humanity go out of the technological sphere of global scale climatic engineering? If humanity does not choose to adapt to the natural environment and to live in harmony with nature as was done close to a millennium by primitive men, will not great risks of global scale befall and destroy humanity? Might human survival on the other hand depend on human intervention to prevent such events from occurring naturally" (Pittock et-al 1978:8)? These are profound questions which go beyond science to deep matters of philosophy and human values. The global nature of the questions demand global answers but humanity is still divided by nationality, ideology, race and religion and is not yet ready to provide definitive solutions to these problems. As such the problems of climate change and variability must be considered not only by scientists but also by all religious and secular philosophies, political administrators and members of the public at large.

This study seeks to contribute to the climate change debate in the following ways:

- The need to make a global contribution to climate change mitigation drive

The whole world is looking for solutions to the problems posed by climate change. With science leading the way, the terrain seems to be difficult to navigate. As such, this study seeks to make a global contribution to climate change mitigation by outlining the possible ways through which religions can be tapped to engender positive attitudes to nature. More so this study seeks to discover how the attitudes, religious beliefs and practices can be mobilised into an eco-friendly environmental ethic that is commensurate to environmental conservation. In the creation narratives, it is believed that God imposed order on a formless chaos. God created the world *ex-nihilo* that is out of nothing (Genesis 1:2). The implication therefore is that God has authority over the world as its Creator with authority over creation. Thus humans are regarded as part of this creation but with specific functions in it. The doctrine of creation leads to an idea of human stewardship over creation holding it in trust for

God. As stewards, humanity is meant to be responsible for the manner in which stewardship is exercised. This insight is of major importance in relation to ecological and environmental concerns in that it provides a theoretical foundation for the exercise of human responsibility towards nature.

- The need for religious representation in climate change mitigation

Religion has never been accorded the same benefit that has been given to natural sciences in trying to find solutions to the problems caused by the changing climate. The reason behind religious segregation is that, religion is deemed a private affair with potential to cause conflicts when it becomes a public affair (Anak 2018). The influence of religion on society is pivotal in formulating an eco-friendly ethic commensurate with environmental conservation. This study also argues for the religious representation of Christian and Shona beliefs and practices that are positive to nature as foundational steps towards climate change mitigation programmes. This is evidenced by the fact that in every community in Africa and the world at large, religion plays a pivotal role in shaping and moulding people's attitudes that engenders positive attitudes to nature.

- The need for an eco-religious and friendly ethic in climate change mitigation

Christian theology and Shona religion have re-discovered that all things that exist on earth are valuable to God who cares for every kind. It can be noted that top soil the world over is being eroded by extensive agriculture, overgrazing and deforestation. The world population is growing at a faster rate than what the natural resources can sustain. Industrial growth and the subsequent consumption of the global natural resources by affluent nations has raised many questions of the long term sustainability the world has hardly began to address (Gottlieb 2004:5). As such this study seeks to cultivate an eco-friendly ethic that borders on long term global views, respecting all forms of life on earth, concern on population growth and inter-religious dialogue.

1.7 Hypothesis

Climate change is a moral problem that demands urgent attention. Disobedience to God's word, the deviation from cultural belief systems and practices and the desire

to accumulate more wealth through unsustainable means has catapulted the environmental crisis. Human disobedience to the word of God is seen in the anthropocentric attitudes of regarding humankind as the central and most important element of existence as opposed to other animal species and created matter. This belief considers humanity to be the most significant entity of the universe and interprets the world in terms consistent with human values. This study hypothesises that religions will play a key role in the global response to climate change. Religions have proved their abilities to encourage positive responses to climate change through their influence on believers' world views and cosmologies (Veldman, Szasz and Haluza-Delay 2012:259). Anthropological studies have demonstrated that religions shape adherents' perceptions and treatment of their natural environment as a living entity and therefore the idea that this influence extends to climate change is much more plausible. Religions are well positioned to play a critical role in addressing the effects of climate change because they have significant economic, institutional and political resources at their disposal (Veldman et-al 2012:259). Religions are collectively in third largest category of investors in the world and they wield considerable political power and influence.

At institutional level, religious influence enables them to reach out to a broad audience through their networks and through interfaith groups and ecumenical groups like the World Council of Churches, faith based relief organisations, like the World Vision (Veldman et-al 2012:261). Further to that Christian institutions like the Roman Catholic Church have enough wealth and power to exert significant independent influence on its adherents. On the other hand, religious leaders' potential spheres of influence are not limited to the members of their faith alone but they also command international recognition and respect that such leaders as the Dalai Lama and the Pope have gained can help draw attention to moral issues of the environment (ibid).

More so, religions have the potential to help in the global fight against climate change because of their ability to provide social capital and to foster relationships that enable communities to achieve collective goals. In the event of natural disasters, faith based organisations are often among the first to respond to crisis. The ability of religions to foster trust and strengthen social ties makes religions well positioned to

help local communities respond and adapt to climate change. This study therefore argues as its central thesis that religion has a major role to play in enabling the world to take necessary steps to address the causes and impacts of climate change related issues in a definitive way.

1.8 Methodology

This study shall employ the mixed methods approach consisting of quantitative and qualitative methods derived from the work of Creswell (2003). Statistical data will be gathered so as to describe the extent of the problem. Simultaneously the voice of the communities affected by climate change will be made heard. Further to that a comparative approach shall be used in comparing the adaptive strategies between Christian and Shona religions. The way in which these two religions can contribute to the creation of a coping mechanism will be compared.

1.8.1 Methodology in detail

- Data collection

For purposes of conceptual clarification, data collection was based on both primary and secondary sources and this is termed triangulation or dual methodology (Creswell 2003:15). Primary data was obtained by the researcher through interviews, participatory observations, action research, life histories among others. Secondary data was obtained from government reports, official statistics, online and web information and historical data.

- Sampling of data

Data was collected in the country's 6 provinces namely Mashonaland east, Mashonaland central, Mashonaland west, Masvingo, Manicaland and Midlands. These provinces were selected using the purposive sampling in those areas that are most affected by the climate change impacts especially in the rural communities. These areas are inhabited by the Shona people though they have different dialects as indicated in chapter 3.

Semi-structured and unstructured questions as well as Participatory Rural Appraisal (PRA) methods namely Key Informant Interviews and Focus Group Discussions

were used to collect both quantitative and qualitative data. Climate change data was collected from the Ministry of Environment and Climate. Rainfall data was collected from the Meteorological Services department and additional rainfall data was obtained from the Agricultural Research and Extension Services (AGRITEX) Head office in the capital Harare.

- Data collection methods: Key informant interviews

Key Informants were selected according to expertise, social standing and length of one's stay in the area. Village heads, Chiefs, political leaders, church leaders and adults who have stayed in the area for a period not less than 30 years were interviewed. Interviews were conducted after clearance had been sought from the local authorities as per the national requirements. Further to that, only those interviewees who agreed to be interviewed participated in the programme. A total of 60 key informants were interviewed in each province with a total of 28 unstructured questions being asked in order to gain the following key information:

-What the people know about climate change.

-Whether they are aware of observable changes in climate.

-Their perceptions and views on weather changes.

-How they have coped with global warming.

-Their views on Agricultural production and poverty alleviation.

-What went wrong in their own perspectives.

-Activities that they are doing to be able to cope.

- Focus group discussions

Focus Group Discussions (FGD's) were used in order to gain in-depth qualitative information for the study. These group discussions comprised of about 10 to 20 people above the age of 40 and these people were chosen on the basis of their period of stay in the area. There were balanced representations for both males and females in some cases, females outnumbered males and all the people participated

freely and willingly. The FGD's were specifically aimed at establishing consensus, clarification and climatic variations experienced in these respective areas.

Further to that, the researcher made use of the experiences and information gained through listening to news broadcasts by both local and international broadcasters in shaping my understanding on the environmental problems humanity is facing today. Informal talks with elderly people on food security, health and well-being became another source of understanding how climatic conditions have been changing.

- Direct observations and field visits

Strategic areas were selected for observations in line with major life supporting activities local people depend on for sustenance to assess and gather information on environmental degradation. Farming areas were visited in Mashonaland west province, mining areas were visited in the Midlands and parts of Manicaland provinces where gold panning and diamond mining activities are done respectively. Game reserves especially Hwange National Park and the Zambezi valley were visited to observe life balance in the wild and to observe the state of the ecosystem. Lake Chivero which as the main supply of water for the city of Harare was also visited. Forest plantations in eastern border were also visited to assess the situation on the state of the forests.

1.8.2 Challenges faced

Many challenges were faced during the period of data collection. The exercise of collecting data was done during the period when political tensions were high in the country. The country is preparing for the 2018 harmonised elections. As a result, gathering people was viewed with mixed feelings especially fear. The challenges were further heightened by the problem of factionalism in the ruling Zanu PF party. This forced a lot of people to shun FGD's for fear of victimisation and being labelled as belonging to a certain political establishment. With such a background, some respondents refused to be interviewed. More so, some legislative laws especially the Public Order and Security Act (POSA) which bars people from meeting in groups made some people reluctant to participate.

The other challenge is that many of the rural populace in most of the time dependant on government and non-governmental organisations for food aid. Some would ask questions like, what will we receive by responding to questions? Upon being told that the interview is specifically to gather information, some were reluctant to answer the questions and would go further to influence others not to participate. However, no financial benefits were given to the respondents for participating in the research.

The financial problem was another challenge that rocked data collection for this study especially when travelling to far away areas for research. The country is faced with the worst liquidity crunch after the 2008 financial crisis and inflation that hit over 2 billion percent. There were delays that were caused by long periods of queuing at banks to get cash which at times would go for days without getting it. Despite these pitfalls, the researcher was able to collect data for the success of this study.

1.8.3 Data analysis

The mixed methods data analysis was used to analyse data from both quantitative and qualitative approaches that were used in the study. All the researched data was analysed for frequencies, relationships and differences between variables and to forecast outcomes. Nominal and numerical scales were used in the data analysis.

- The comparative approach

The comparative method was used in this study to explore that which is common among the religions under study. This researcher employed this approach in comparing the different perspectives on attitudes towards nature as they are presented in Christian and Shona religions. The comparative approach deals with the systematic comparison of the two religions understudy. This approach gives a deeper meaning of the ethics of a particular religion, belief systems, and practices with regards to the sacred, the numinous, the spiritual and the divine. This study shall employ this approach in comparing different perspectives on attitudes to nature as they are presented in Christian and Shona religions.

- The phenomenological method

The phenomenological method was used to analyse data thereby allowing different groups to speak through themselves and their literature without value judgements. This approach is concerned with describing phenomena in terms consistent with the orientation of the believer belonging to a specific religion. According to Creswell (1997:58), the basic purpose of this approach is to reduce individual experiences with a phenomenon to a description of the universal essence.

This is an approach that allows the researcher to enter into an aspect of the informants' religious world as it presents itself to their consciousness in order to experience religion as it is lived (Stausberg and Engler 2011:333). This approach is concerned with describing the meaning for several individuals of their lived experiences of a concept or phenomenon (Creswell 1997:57-58). This approach focuses on describing what all participants have in common as they experience a phenomenon for example the climate change impact is universally experienced. The basic purpose is to reduce individual experience with a phenomenon to a description of the universal essence that is a grasp of the very nature of the thing (Creswell 1997:57-58). To this end, the researcher identifies a phenomenon or the "object" of human experience and then collects data from persons who have experienced the phenomenon and develops a composite description of the essence of the experience for all individuals. This description should consist of what people experienced and how they experienced it.

In this study two forms of the phenomenological approach shall be employed. First is the hermeneutical phenomenology which oriented towards lived experiences and interpreting the "texts" of life that is hermeneutics (ibid). Further to that it is not only a description but also seen as an interpretive process in which the researcher makes an interpretation of the meaning of lived experiences. In the process researchers reflect on essential themes, what constitute the nature of this lived experience. Secondly is the transcendental form which focuses less on interpretation of the experiences but more on the description of the experiences of participants. In this case the researcher is required to take a fresh perspective towards the phenomenon

under investigation hence transcendental where-by everything is perceived freshly as if for the first time (Moustakas 1994:34).

More importantly the phenomenological approach in the study of religions attempts to understand religion from the perspective of the religious persons themselves. This method holds that understanding should precede evaluation when it comes to studying religious phenomena and that the primary goal of the initial phase of study should be to understand the religion as much as possible from the inside (Young 1997:12). In this study the goal is to seek to understand Christianity and Shona religions from the perspectives of the adherents and that is idealistic.

Two premises make the basis of the phenomenological approach. The first one is that human experience is a valid, rich and rewarding source of knowledge as well as the source of all knowing and the basis of behaviour (Amanze 2010:257). What people are aware of at any point in time is the foundation of their knowledge themselves, of other people and the world in general. Without human experience, the human world would be impossible to comprehend. The second premise lies with the view that our everyday world is a valuable and productive source of knowledge and that human beings can learn much about themselves and reap key insights into the nature of an event by analysing how it occurs in their daily lives (Amanze 2010:257).

By concentrating on experience in the lived world rather than on traditional empirical-analytical research, the phenomenological approach departs from the philosophical assumptions inherent in the positivist models of research which states that scientific methods of measuring behaviour ensure objectivity and that researchers do not influence their findings (ibid). The purpose of a phenomenological approach is to uncover the nature of experience while at the same time maintaining the integrity of the individual's perception. In the phenomenological method, when analysing data, the researcher must follow what is called bracketing and intuiting. The former is the process of identifying and setting aside any pre-conceived ideas, beliefs and opinions one might have about a phenomenon under investigation and that is called *epoche* (Smart 1973:56). In other words, the researcher must bracket the all he or she knows and any pre-conceived ideas to avoid a biased consideration of issues. *Epoche*

cultivates an attitude of openness to the phenomena of religion. This is crucial since researchers are susceptible of the tendency to judge other people's religions and beliefs. It is natural to approach the world using our own values. The process of socialisation that we undergo as we grow up conditions us to regard certain beliefs and practices as right or wrong therefore *epoche* comes in to assist researchers to avoid making distinctions between true and false religions. Alongside the concept of *epoche*, researchers must cultivate empathy towards religious individuals and communities that they will be studying. The major argument for promoting an empathetic understanding of religion is that the focus of religious studies is fellow human beings unlike other disciplines that tend to concentrate on inanimate objects (ibid). Humans have emotions and feelings of their own which should be respected. On the other hand, intuiting refers to a situation where the researcher focuses on the lived experiences of the subject without forcing prior expectations or knowledge in the process (ibid). Through intuiting the researcher becomes totally immersed in the phenomenon under investigation and he or she begins to know the phenomenon as described by the participants.

It is worthy to indicate here that phenomenology as an approach has been criticised on many fronts. One of the devastating criticisms presents it as an idealistic method that does not have practical applicability. Despite the criticism, phenomenology seeks to promote scholarly accuracy and neutrality whereby the scholar of religion is expected to refrain from giving value judgement, hence its usage in this study.

1.9 Scope and limitations of the study

This study seeks to establish the role that religion can play in coping with climate change in Zimbabwe by focusing on Christianity and Shona religions. This study identifies adaptive strategies that Christianity and Shona religions proffer in formulating environmentally friendly attitudes. Statistical data will be gathered using the quantitative model to validate the extent of the climate change problem in Zimbabwe. Field observations will be conducted and the voices of the affected communities will be made heard. Comparisons will be made on the adaptive strategies between Christianity and Shona religions and figure out how the two religions can contribute to the formulation of a climate change coping mechanism.

1.10 Chapter outline

This study is presented in six chapters:

Chapter 1 introduces the study and give the background to the study, the research problem, research objectives, hypothesis to be tested, justification, overview of existing literature, research gap, methodology, scope and limitation of the study and outline of chapters.

Chapter 2 reviews related literature on Religion and Ecology. This chapter shall also explore the causes and impact of climate change in Zimbabwe.

Chapter 3 is a reconstruction of the land and its people. This chapter describes the physical location of the study area, the livelihoods of the inhabitants of the study area, their religion and practices, beliefs and culture. Further to that, demography, climate and vegetation of the study area shall be explored.

Chapter 4 is a presentation of research findings and a comparison of adaptive strategies to cope with climate change between Christianity and Shona religions.

Chapter 5 is an evaluation of research findings.

Chapter 6 consists of recommendations and conclusion.

1.11 Overview of existing Literature

This writer acknowledges that many works have been written in this area of Religion and Ecology. However, there appears a gap as the field is filled with scientific efforts to curb climate change. The contributions of religion are rarely considered yet they can provide fruitful interventions in adapting to climate change. As a result, this study shall make use of published books, journal articles and online publications. These sources are important for this study because they provide the basic understanding of climate change and give some global solutions to the problem which is a fertile ground for this study.

Chapter 2

Review of related literature

2.1 Introduction

This writer acknowledges that many works have been written in this area of religion and ecology. However, religion has not been accorded enough space in global efforts to curb climate change as presented in chapter 1. The contributions of Christian and Shona religions are rarely considered yet they can provide definitive solutions in helping communities to be able to mitigate and adapt to climate change. As a result, this study seeks to bridge the gap by integrating religious factors and considerations together with scientific findings and provide definitive and lasting solutions to the problems affecting the world today. Online publications, published books, journals, articles shall be reviewed in this chapter and establish their contributions and gaps. These sources are important for this study because they provide the basic understanding of climate change and give some global solutions to the problem the world is facing. The causes and effects of global warming and climate change shall be explored in a bid to conscientise people on the need to mitigate the prevailing environmental problems.

2.2 Literature review

According to Hessel and Ruether (2000:xv), religions help to shape the people's attitudes towards nature in both conscious and unconscious ways. They also hold that religions provide basic interpretive stories of who we are, what is nature, where we come from and where we are going and this comprises a world view of a society. In their view, religions generate world views and ethics which underlie fundamental attitudes and values of different cultures and societies. It is noted from this book that what people do about their ecology depends on what they think about themselves in relation to things around them. Human ecology is deeply conditioned by beliefs about human nature and destiny that is by religion. The view of these authors is that the solution to the problems of global warming and climate change lies within the human change of attitude towards nature. It is of course very important for humanity to view nature with a conservation mind-set but this book does not address the Zimbabwean context and situation which this study seeks to explore. Further to that the book is silent on Christian and Shona religious belief systems and practices

which this study argues for their adoption and inclusion in climate change debates as they can provide valuable interventions in reducing the impact of climate change. It is therefore the task of this study to fill in this gap by formulating a Christian and Shona religious and eco-friendly ethic that is commensurate with environmental conservation.

Gottlieb (2004:7) puts it as follows, “how religions shaped our understanding of our conduct towards nature and how the environmental crisis challenged and transformed modern theology and spiritual practice is key”. As a key component to human civilisation, religions have become critical elements of the environmental crisis. In recent years, religious institutions have tried to alter current destructive patterns, thus religions have been neither simple agents of environmental domination nor unmixed repositories of ecological wisdom (ibid: 22). The writer holds that, historically religions have been understood to condone or perceive and to act on non-human nature in terms of human interest, beliefs and social structures. Nature has been shaped through religious myths and framed in terms of human needs yet at the same time religion has also represented the voice of nature to humanity. Spiritual teachings have celebrated and consecrated peoples’ ties to the non-human world and reminding humanity of her delicate and inescapable relationship with the environment and fellow beings. However, Gottlieb focused on a different geographical location to the Zimbabwean location which is understudy, as such the contexts differ and this study’s main focus is on adaptive strategies between Christianity and Shona religions.

The problem of climate change must involve a vast range of disciplines, interests and techniques. The world over, climate change mitigation progress has suffered in the past from a lack of effective communication across disciplinary barriers. Pittock et-al (1978:12) put it as follows, “the geological literature contains many examples of sound geology of palaeo-climatic interest which is nevertheless coupled with inadequate meteorological interpretation. Similarly, too much of meteorological literature including numerical modelling is lacking in perspective to the reality of what has been happening in the past”. These writers hold that inter-disciplinary collaboration is lacking in most areas of study and that has rendered the climate change agenda a failure. Nevertheless, a multi-disciplinary approach has been

adopted but strictly confined to natural sciences alone leaving out the religious dimension. As such this study seeks to fill in this gap by unveiling possible avenues through which religious beliefs and practices can be tapped to help in mitigating the impact of the changing climate.

Pittock et-al (1978:19) further put it as follows, “the study of climate change and variability should make use of the contributions and interactions between and not only meteorologists, geographers, geologists, glaciologists, mathematicians and statisticians but also chemists, botanists, biologists and even historians and economists”. The subject of climate change is so fraught with complex, physical, biological and cultural interactions and feedbacks that any worker from a single discipline must inevitably trespass outside his or her own area of expertise. Working on climate change in isolation from other institutions, the results are too often oversimplification and error. The very nature of climatic interactions therefore demands inter-disciplinary approaches and exchanges at a scientific level (Pittock et-al 1978:31). Nevertheless, global efforts are being done in as much as climate change mitigation programs are concerned but it lacks inter-disciplinary inclusion where by religious inputs are not considered yet religions can proffer fruitful interventions in the fight to save the environment for posterity. It is thus the focus of this study to fill in this gap and help find solutions to the problems of climate change.

Religious world views and images of nature informs the activities of a large number of people in the world which is why they can be crucial driving forces of environmentally friendly behaviour in both quantitative and qualitative terms (Gerten and Sigurd 2012:43). These writers also hold that religious belief is an important factor in climate change mitigation because when everything crumbles, only belief and hope remains. These writers also outlined the functions of religion in post-modern societies in relation to climate change and development as sustainable to the climate change mitigation drive since religion offers cultural background for societies the world over. As such religions create a very strong emotional adherence amongst believers and having a transcendent authority in the background always motivates the great number of people to follow this authority with conviction. Further to that, Gerten and Sigurd (2012:45) argue that religious features can support ethically informed pathways of sustainable development because of their strong

moral orientations. However, despite taking note of the importance of religion in the global fight against climate change, the writers only generalised the issue of religion as a factor especially on sustainable pathways through strong moral convictions. The writers did not hasten to say how religion can be tapped to assist in climate change mitigation. This therefore is the gap that this study seeks to fill in fully engaging religion to formulate adaptive strategies for coping with global warming.

White (1969:42-47) puts it as follows, “religion is the root cause of the ecological crises. The victory of Christianity over paganism was the greatest psychic revolution in the history of our culture”. White details how Christianity contributed to the degradation of the Earth for humanity’s selfish ends and argues that religions must also provide solutions to the problems of climate change. However, Lynn White pointed out that religions contributed to the degradation of the environment but did not address how religions can be used to address the problem of climate change. As such this study seeks to address this unattended gap by delineating ways through which the Christian and Shona religious beliefs and practices can be used to try and address the problems facing humanity today.

John Houghton (1994:67) contends that Global Warming has become a world reality and thus his book aims to state the current scientific position on Global Warming clearly so that informed decisions are made based on the facts. Human industry and other activities such as deforestation are emitting large quantities of gases in particular carbon dioxide into the atmosphere adding to the already present in atmospheric carbon dioxide a further seven thousand million tonnes (ibid). This has resulted in extremely high temperatures on planet earth. He further outlines the effects of greenhouse gases on the climate whose balance has been greatly disturbed by human activities. However, Houghton’s book is specifically for the British society which is different from the society under study. Further to that Houghton provides scientific and political solutions to the climate change problem calling upon developed countries to return greenhouse gas emissions in particular carbon dioxide to their 1990 levels by the year 2000. The Earth Summit that was held in Rio de Janeiro Brazil in 1992 ratified the protocols that were signed on reducing carbon dioxide to 1990 levels. This was to be done through the adoption of energy saving measures by switching on to fuels such as natural gas which

generates 40 percent less carbon dioxide than coal and 30 percent less than oil. Unfortunately, this did not happen as planned and the problem of climate change continues to rise. The attitudes of some states that were said to be major polluters like the United States of America and China sighted unfairness on the protocol and dragged their feet thus stalling the progress of reducing carbon dioxide accumulating in the atmosphere. The issue at stake here boarders on human attitudes which this study seeks to propound and harness in the climate change mitigation programs. It is evident the religious dimension is left out which this study seeks to explore and thus compliment the scientific efforts to curb the effects of climatic changes.

From the twenty first century onwards there is wide agreement among scientists that the balance of life on planet Earth is in danger (Young 1997:281). The author points out issues of ozone depletion, gas emissions, deforestation, population growth and nuclear proliferation as major factors behind the ecological crisis. Young argues that the very roots of the modern environmental crisis are found in the teachings of Western religions that humans are distinct from nature and have a divinely sanctioned right to exploit nature. He gives an insight that indigenous religions of Africa and their worldviews are bio-centric and animistic meaning that all living beings are seen as members of one inter-dependant, spiritual community. Therefore, it is critically important that humans live in harmony with the rest of the natural world. Young argues that the world exists in a delicate balance, so humans must always act reciprocally taking only that which is truly needed and replacing and replenishing whatever is used. Everything that is done should be seen as part of a sacred interaction between humans and the rest of nature. However, the writer just generalised the importance of religions but did not clarify how these religions can be tapped to try and curb the effects of climate change. As such that is the gap that this study seeks to address.

Daneel (1999:41) tries to capture an African centred view of environmental preservation. He explores the traditionalist earth-clothing *mafukidzanyika* ceremony whereby communion with the spirit world strengthens the spiritual, communal and ecological resolve. The role played by Association of Zimbabwean Traditional Ecologists (AZTREC) in its quest for responsible earth-care and the outstanding feature of its work is the ability of the traditional custodians of the land to appropriate

and revitalise Africa's old age religio-ecological values in a modern program of environmental reform (Daneel 1999: 43). He further holds that active and direct involvement of the people to solve the climate change problems which when taken seriously, will yield results in Zimbabwe's quest to avert the global warming problem. He outlined the efforts of local people in preserving the environment but did not outline how exactly religions can help in averting this global problem of which this study seeks to address.

Human activities have led to the global climatic problems faced today especially through industrial and Agricultural development. These have contributed immensely to global warming (Gupta: 2001:27). Gupta mentions the ratifications of protocols including the Montreal and Kyoto in 1987 and 1997 respectively and many more where the world powers like the United States of America refused to commit to these agreements on the basis of unfairness as it stated that the developed states should play a major role to return the emissions to 1990 levels. Gupta also noted that the climate change issue affects all of us but the climate change negotiations are limited to states only and their representatives. Non-state actors like religious leaders are invited to participate as observers in the international process since article 71 of the United Nations charter 1945 does not give room for participation of non-state actors and was reaffirmed by a decision at United Nations Conference on Environmental Development (UNCED) in 1992 (Gupta 2001:27). Gupta advocates for an equal participation by non-state actors including Faith Based Organisations (FBO) to have a holistic approach in combating global warming but does not elucidate how Faith Based Organisations can assist in coming up with adaptive strategies for coping with climate change and how they can be utilised for adoption in the climate change mitigation drive which is the focus of this study.

It is widely believed that developing countries have contributed very little to the problem of climate change but they are the most affected due to lack of climate change information and poor adaptation strategies. Further to that, developing countries' high dependence on local bio-diversity and ecosystems as sources of sustenance and well-being greatly affect local people in developing countries (Raygorodetsky: 2011). He further points out that religious practices and knowledge provides a crucial foundation for community based adaptation and mitigation

strategies that sustain the resilience of social ecological systems at global scales. It is of course valid that religions provide crucial foundations, however the issue of Christian and Shona religious considerations and involvement in climate change mitigation is not addressed which is the focus of this study.

2.3 Causes of global warming and subsequent climate change

Climate is caused by factors such as biotic processes, variations in solar radiation received by the earth, plate tectonic movements and volcanic eruptions. Certain human activities have also been identified as significant causes of recent climate change which is often referred to as global warming. The term is sometimes used to refer specifically to climate change caused by human activities as opposed to changes in climate that may have resulted as part of the earth's natural processes. In this sense especially in context of environmental policy making and implementation, the term climate change has become synonymous with anthropogenic global warming. It is primarily the problem of too much carbon dioxide in the atmosphere which acts like a blanket trapping heat and warming the earth. As humanity burn fossil fuels for energy and cut down trees and burn forests to create pastures and plantations, carbon dioxide accumulates and overloads the atmosphere. Certain waste management and agricultural practices aggravate the problem by releasing some other potent gases like methane and nitrous oxide adding to the high amounts of carbon dioxide in the atmosphere.

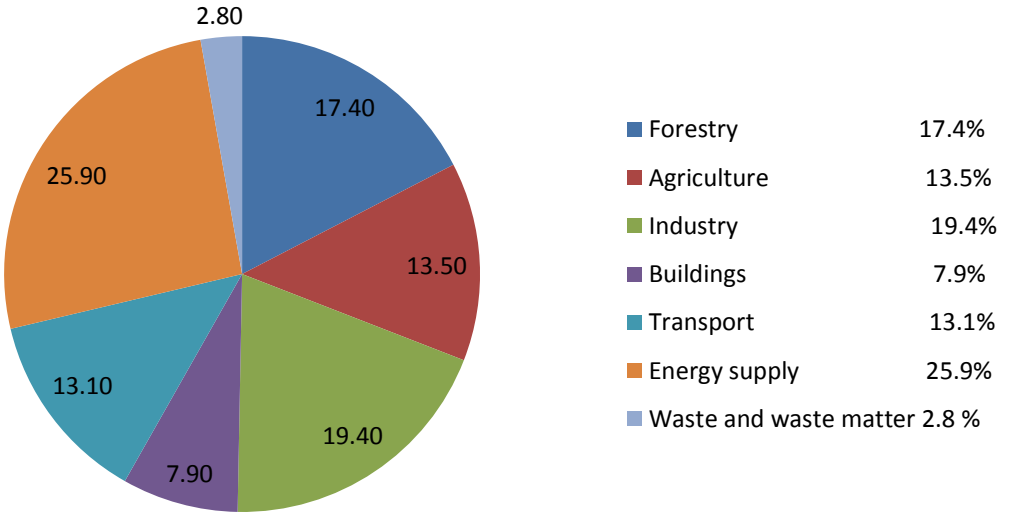


Figure 2.1 Breakdown of heat-trapping emissions by economic sectors.

Source: www.nmsea.org/.../global-warming/fossil-fuels-and-global-warming.

Scientists have been investigating the possibility that human activities can alter the earth's climate since the 1930's (Veldman et-al: 2012:254-257). Around 2007, scientists had amassed enough evidence that climatic changes of geological proportions are a result of human activities. The Inter-Governmental Panel on Climate Change (IPCC), which is the leading international body devoted to coordinating climate change science and policy making affirmed in its 2007 report that the warming was the result of human activities especially those that lead to the release of greenhouse gases. The continued build-up of these gases will result in dramatic weather changes at global level including sea level rise, coastal erosion and increased frequency of floods and droughts.

Climate change which is a direct consequence of burning fossil fuels releasing carbon dioxide gas and methane into the atmosphere destroying forests, threaten humanity with an unprecedentedly fast global warming (Gottlieb 2004:48). As a result, climate change is altering the living conditions of the entire planet and threatens the very existence on earth of all kind. The reduction in the ozone layer which shields the earth from ultra-violet rays poses humans to dangers of immune system damage. It leads to increased danger of skin cancer and cataracts and threaten the Deoxyribonucleic Acid (DNA) molecules of all living things and

vulnerable are the phytoplanktons, the foundation of aquatic food chain which are weakened by Ultra-Violet Radiation (UV) exposure (Gottlieb 2004:53).

Global warming is the greatest crisis ever collectively faced by humankind. Unlike other crises, this is global in nature and threatens survival of civilisations because climate changes of geological proportions are occurring over time spans as short as a single life time (Agarwal 2011:35). Nowadays the dominant patterns of production and consumption are being globalised causing more environmental degradation of life-supporting ecosystems and massive loss of bio-diversity. Globalization is giving priority to economic development at the expense of social development and ecological conservation. The effects of such unsustainable development strategies have marginalised and impoverished many people including owners and custodians of traditional knowledge and bio-diversity, indigenous peoples, older persons, farmers and women. There is increasing concern about the gradual warming of the atmosphere through greenhouse effect and consequent climate change. The IPCC in 1990 estimated that the business as usual scenario will lead to an increase in global temperature of about one degree Celsius above the present value by the year 2025 and three degrees Celsius before the end of the next century (Agarwal: 2011:37). There are so many greenhouse gases that adversely affect the world's climate with the most steadily increasing gases being carbon dioxide, methane, chlorofluorocarbons and nitrogen oxides. The atmosphere acts as a greenhouse for the earth, by letting through incoming light but shutting in heat thereby increasing the atmosphere's ability to block the heat leading to warmer temperatures and climate change.

-Agriculture

Livelihoods in the African continent and other up-coming economies in the world are directly agro-based. The rural populace in Africa heavily depend upon the forests for energy. About 310 000 hectares of forest land are destroyed annually with tobacco farming being one of the major drivers of forest destruction (Zingwena in Zimbabwe Herald, June 2016). Reserves and game refuges cannot remain as human populations expand, firstly dangerous animals are killed and then the land is taken over for irrigation and agriculture. Conservation movements are powerless against

the demands of the needy people for land. On the other hand, political mileage is also gained by giving people more land. This has been necessitated by the fact that politicians are concerned with the immediate short term political benefits at the expense of long term environmental damage. South Africa must be careful especially the pressure being exerted by the opposition Economic Freedom Fighters party to have land redistributed as this may destroy the economy and the environment. Lessons have to be drawn from the chaotic incidences in Zimbabwe where environmental degradation heightened since the government began the land reform programme when poor farming practices destroyed a once promising economy.

The major cause of deforestation is the continued utilisation of the world's resources, and thus the need for land on which to construct roads, build houses for the fast growing population, industrialisation and agricultural development is on the rise. The need for timber to cater for the growing population is another factor leading to the destruction of forests the world over. The major problem is that despite benefiting from the forests, man does not think of replenishing the forests by planting trees to replace those that are cut for wood and timber. Land clearance for agricultural purposes is widely believed to be the biggest immediate cause of deforestation in developing countries. The World Bank in its 2000 report indicated that the new settlements and agriculture accounts for sixty percent of land deforestation in developing countries (www.fao.org). Due to an unprecedented increase in agriculture, large tracks of forested land have been destroyed, and it appears that the relatively low agricultural productivity per unit area has been compensated by an enormous increase in the area of land cultivated and this is one indication of poor farming methods. The forested areas that were lost to agriculture in Zimbabwe between 1992 and 2008 rose from 27.48 percent to 41.24 percent that is way above normal land use, a drastic situation that if not controlled, will turn the country into a desert within decades. Figures 2.2, 2.3 and 2.4 below shows lost forest land in Zimbabwe.

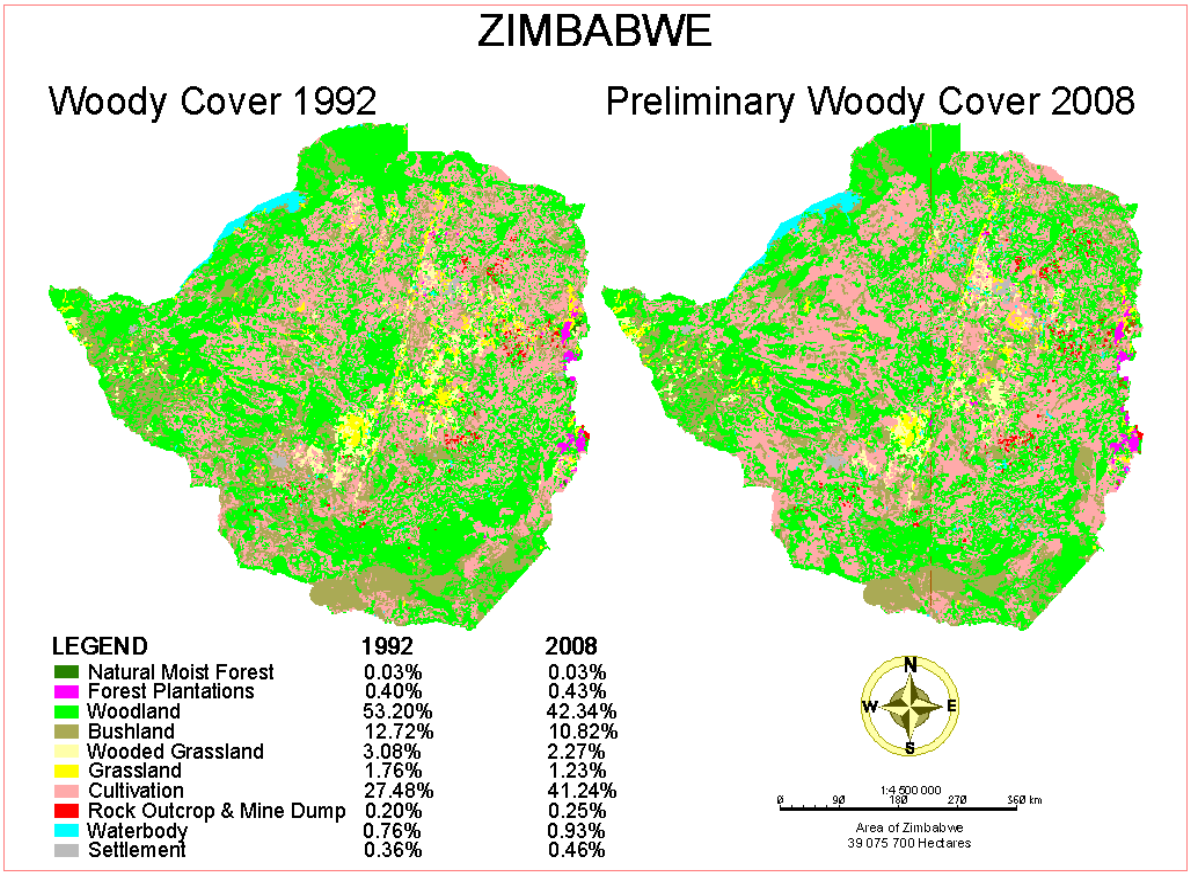
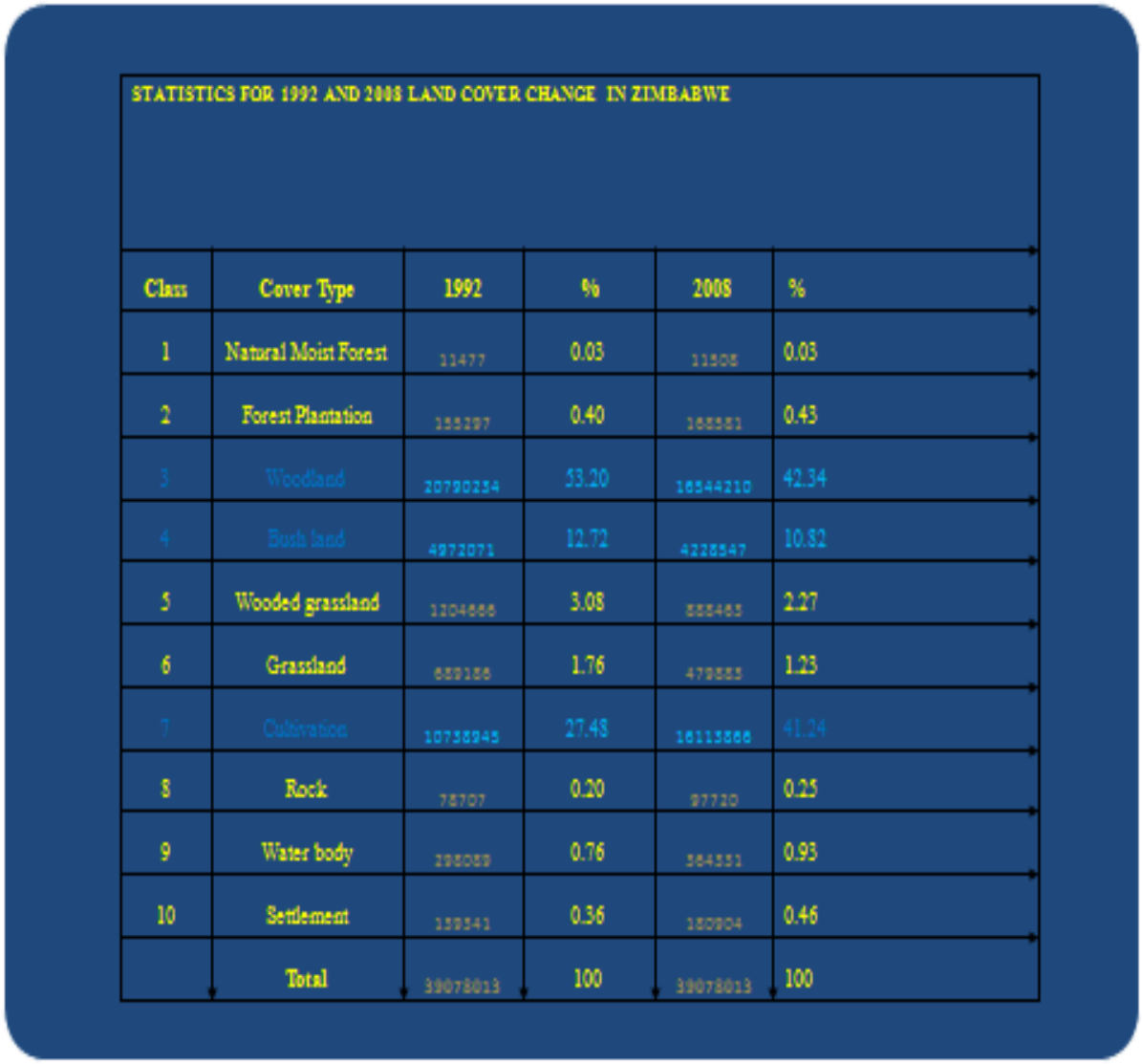


Figure 2.2. Illustration showing the loss of vegetation in Zimbabwe between 1992 and 2008.

Source: Forest Commission of Zimbabwe.

From the above diagram, it can be noted that human activities had greater effect on the land and vegetation. Cultivation rose from 27.48 percent to 41.24 percent which is a high margin. Around 10.86 percent of woodlands was lost during the same period. Despite the losses to the vegetation, nothing meaningful is being done to replenish the trees that were lost to agricultural land preparation. It is evident that during and after the land reform there was no meaningful follow ups on government legislation on the cutting of trees and reforesting the affected areas.



STATISTICS FOR 1992 AND 2008 LAND COVER CHANGE IN ZIMBABWE

Class	Cover Type	1992	%	2008	%
1	Natural Moist Forest	11477	0.03	11505	0.03
2	Forest Plantation	155297	0.40	168581	0.43
3	Woodland	20790254	53.20	16544210	42.34
4	Bush land	4972071	12.72	4228547	10.82
5	Wooded grassland	1204666	3.08	888483	2.27
6	Grassland	688186	1.76	478883	1.23
7	Cultivation	10758945	27.48	16113866	41.24
8	Rock	78707	0.20	97720	0.25
9	Water body	298059	0.76	364551	0.93
10	Settlement	139541	0.36	180904	0.46
	Total	39078013	100	39078013	100

Figure 2.3. Statistical data on land use in Zimbabwe.

Source: Forest Commission of Zimbabwe.

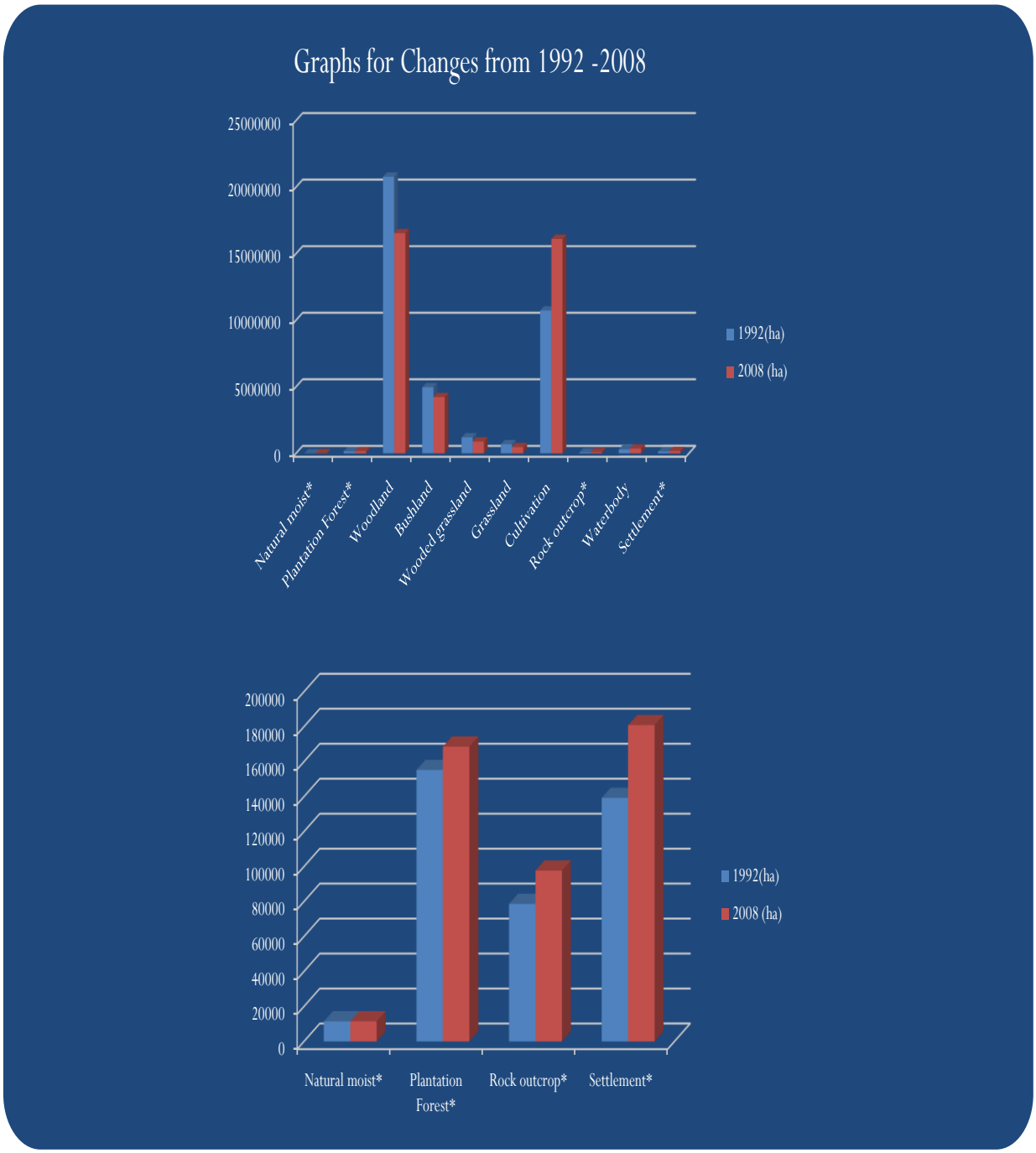


Figure 2.4. Statistical representation of land lost to agriculture and settlement in Zimbabwe.

Source: Forest Commission of Zimbabwe.

This trend illustrated in the above graphs calls for immediate action to save Zimbabwe from being reduced to a desert in the near future. As such religious considerations at this point are very important which is why this study seeks to

bridge the gap between natural sciences and religious ways to mitigate the effects of climate change.

- Industrial emissions

Climate change raises serious questions about the development and economic models upon which our life styles have been founded. According to the (IPCC report 2007) report, there is now more than ninety-five percent certainty that climate change has been caused by human activities. The burning of fossil fuels to industrialise and develop nations is responsible for the emissions of greenhouse gases that cause climate change. On the one hand, climate change is a result of unsustainable practices and on the other hand it is one of the major threats to sustainability of lives and livelihoods especially that of the poor and the vulnerable people (IPCC report 2007). Human induced climate change is being precipitated by the current developmental patterns. In fact, the prevailing economic strategies promote endless growth and production of goods and high consumption life styles in richer and industrialised countries. As a result of such unsustainable patterns of development and seemingly insatiable levels of unsustainable consumption levels, large amounts of carbon dioxide emissions, deforestation, extractive industries among others are leading to the depletion of critical natural resources with life threatening consequences for impoverished countries, inhabitants of low-lying areas, vulnerable groups and future generations (IPCC report 2007).

Certain atmospheric emissions from various human activities are unambiguously responsible for the global warming crises. These gases include carbon dioxide, the necessary product of combustion of fossil fuels, biomass burning and deforestation, methane gas from anaerobic digestion of organic matter in the water logged paddy fields, chlorofluorocarbons from refrigeration and halons from firefighting systems (Agarwal 2011:54). The global warming problem is further compounded by deforestation which contributes to increased carbon dioxide and other greenhouse gas emissions due to decreased carbon fixation in biomass because of the reduced tree cover. It has been estimated that carbon dioxide accounts for about fifty percent of the global warming effect (Agarwal 2011:57). As a result of industrial emissions,

global warming is increasing on a daily basis where millions of tonnes of carbon dioxide are deposited into the atmosphere.

- Population growth, poverty and deforestation

The major drawback to sustainable development issues the world is facing today is the ever growing population. As per the United Nations population statistics, the world population grew by an alarming 30 percent between 1990 and 2010 (Smit 2017). This excessive world population is causing undue pressure on the world's diminishing resources especially in those countries that have not yet achieved full potential and development. Thus, the huge population results in rapid exploitation of all fixed and exhaustible resources. People around the world have begun to address the problem of global warming by reducing carbon footprints through better energy technologies and reduced consumption in industrialised nations. However, the unsustainable human population growth overwhelms all these efforts. Population growth will continue to contribute to the dangerous increase in greenhouse gases in the atmosphere since demand for food and consumption of resources will rise. The rapid rise in the world`s population and the ever growing dependence on fossil fuel based modes of production has played a considerable role in the growing concentration of greenhouse gases into the atmosphere (Raygorodetsky 2011).

Population growth together with poverty and unemployment which is estimated to be above 80 percent has forced many people in developing countries to depend heavily upon natural resources which are fast becoming scarce compared to the growing population. The demand for land has seen millions of hectares of forest land being cleared for agricultural purposes in the entire African continent and the world over. Agarwal (2011:63) puts it as follows, "human survival depends on natural resources especially on forests and about one million years ago the forests on this planet were plentiful, beautiful and bountiful when the first man Homo sapiens came to exist". Forests were much required to be cleared for man's safety and survival. With the progression of civilisation, man chose the settled life so clearance of the forests for cultivation and settlement became indispensable.

Approximately 600 million children in developing countries live on less than a dollar a day and usually many children under five years dies of hunger every 3.6 seconds

(Beach 2012) on the are the causes of poverty in developing countries. In many developing countries, corruption and elitism have contributed to income inequality and high levels of poverty. In a system where government rules are flouted, bribery rewards those with money to get government contracts. This scenario results in a situation where by a small group of the already wealthy become more wealthy and powerful while the majority of the population is left in abject poverty. Zimbabwe has one of the best education systems and literacy rate in Africa but many poor children do not go to school, which is one sure way lost that could lift them out of poverty, since they are forced to work to help to support their families.

Rapid urbanisation, industrialisation and consequent pollution of land, air and water, construction of roads has contributed to further destruction of the forests. The introduction of extensive cultivation of plantation crops like tea, eucalyptus have taken a heavy toll of even the relict forests hills of Nyanga in the eastern parts of Zimbabwe. There is an ever increasing demand for both farmland and grazing land which results in the burning and clearing of forests for agricultural production in Zimbabwe.

With the huge population, the demand for land in Zimbabwe rose and since the year 2000 which saw government acquiring former white owned vast tracks of land much of which were not used but kept safe from destruction, and as a result the high population of landless Zimbabweans occupied much of these lands many of whom have poor farming knowledge and this signalled the increase in deforestation as much land was cleared for farming purposes. One notable problem is that due to poor farming practices, high yields are expected from large tracks of land which in turn leaves the forested land cleared. The cutting down of trees has an effect on the climatic conditions since carbon fixation is reduced due to lack of tree cover, and if uncontrolled arable land is lost. Loss of arable land will further deepen the problem at hand especially its effects on food security where the country will have to feed the ever growing population.

Figure 2.5 below shows a pile of wood that is meant to cure tobacco at a local farm in Hurungwe. Approximately 98 percent of the people in Hurungwe are tobacco farmers and this crop has brought extensive damage to the forested areas as the

demand for wood to cure tobacco is ever rising. Coupled with poor farming methods, the environmental degradation is getting worse by day and because of poverty. Alternative power sources are very expensive to employ especially solar power and electricity whose production in Zimbabwe is currently very low. The rate of deforestation has risen since the beginning of the fast track land reform programme in the year 2000.

Figure 2.5. Piles of wood to cure tobacco at a local farm in Hurungwe.

Photograph taken by this researcher.

2.4 Impact of global warming and climate change

Global warming has devastating effects on the environment. Human beings continue to be exposed to climate change through changing weather patterns for example, more intense, frequent and extreme events affecting livelihoods. These calamities cause deaths, disabilities and suffering (Parry, Canziani and Palutikof 2007:393). This suffering increases vulnerability and reduces the capacity of individuals and communities to adapt to climate change. Populations with higher rates of diseases and debility cope less successfully with the stresses of survival including those related to changing climate because the health of a community is an important element that enables adaptive capacity.

Human activity is rivalling nature's ability to produce climatic changes. Although there are huge uncertainties in people's knowledge on climate, many climatologists now believe that future climates will differ significantly from those of today. The reason for the huge shift is that there is a steady contribution to the atmospheric burden of carbon dioxide produced largely through fossil fuel burning and possibly through deforestation which is on the rise. There is growing world concern that the carbon dioxide build-up will lead to a global warming without precedent in human history. It is quite possible that this so called greenhouse effect will dominate within the next fifty years and major alterations of regional rainfall patterns, their magnitude and timing are expected to occur.

The human induced climate change is rising at an alarming rate. The IPCC in its 2007 report indicated that variability is expected to increase with more rain falling in some areas while in some areas there would be a decrease in precipitation as expected. While some countries in temperate zones may benefit from climate change, many countries in tropical and sub-tropical zones will be more vulnerable to potential impacts of global warming (Rosenzweig and Parry 1994:13). Agricultural production in many African countries and regions is expected to be severely affected by climate variability and change. Crop yields are projected to decrease heavily and this will further and adversely affect food security and increase malnutrition in the continent. In some African countries, crop yields from rain-fed agriculture will be reduced by up to 50 percent by 2020 (IPCC report 2007). Such an enormous reduction in crop yields is of major concern that the climate change mitigation drive must be stepped up to save the environment for posterity.

Climate variability is regarded as one of the largest stumbling blocks to stable agricultural production and disease control. Food supplies are vulnerable to climatic anomalies and occasional abnormal weather patterns. Climatic fluctuations more often accelerate the degradation of natural forest lands, increase wind and water erosion of productive agricultural and grazing lands and thus heighten the effects of overgrazing and desertification leading to massive losses of arable land. These short term impacts constitute a serious threat to people's ability to sustain increasing world populations. Further climatic changes will make things worse in the world. Clearly, this prospect of a major environmental change presages globally important social,

economic, political and ethical issues. The effects of carbon dioxide build-up in the atmosphere are severe. The carbon dioxide gas absorbs infrared radiation coming from the earth's surface and reradiates a part of it back down thereby warming the planet. This is referred as the greenhouse effect. Furthermore, there are other infrared absorbing trace gases being added to the atmosphere by humans such chlorofluorocarbons methane, carbon monoxide, nitrous oxide and ozone. These gases increase the greenhouse warming by as much as fifty percent above the warming from carbon dioxide alone. Carbon dioxide induced climatic impacts may affect many aspects of human activity. The activities that are considered more closely related to the carbon dioxide problem include energy supply and demand, world food production, water resources, human health and diseases, population settlements among others.

2.5 Impact of climate change on food production

The stability and distribution of food production has been greatly affected by a large scale climatic warming. Plant physiology, pests, water availability and soil conditions are vital to crop growth and are already altered since the global temperatures are increasing. Of the world's major crop destroyers, pests cause the greatest crop losses in bananas, potatoes, cassava, tomatoes, peanuts, soya beans, wheat, maize, rice among many more. With global warming there are changes in the frequency and geographical distribution of plant diseases and epidemics.

Zimbabwe has experienced severe droughts in the years 1982, 1992, 2002, 2012 and these droughts were a result of the erratic manner in which rain has been falling and high temperatures. The 2016/2017 farming season has been badly affected by the army worms across the country and maize crop is the most affected. In other years Zimbabwe received too much rainfall as evidenced by the 2013 Tokwe-Mukosi disaster in Masvingo province and floods in Muzarabani valley in the northern parts of Zimbabwe. All these problems are due to the global warming effects. As a result, food production has been badly affected and this has led to abject poverty and hunger in Zimbabwe since many people depend on rain-fed agriculture and together with the collapse of industries, many have resorted to agriculture but with no adequate farming skills which has worsened the situation. So the effects of global warming have been felt heavily in food production.

Climatic changes are projected to harm millions of people around the world, the poor being among the most vulnerable as many of them live in low-lying or drought prone areas (IPCC report 2007). If global temperatures continue to rise even by only one or two degrees centigrade, those living in already stressed regions will be unable to grow enough food leading to increased cases of malnutrition, vulnerability to diseases, conflict over scarce resources and pressure to migrate (IPCC report 2007).

2.6 Impact of climate change on fresh clean water

Water is a fundamental resource to agriculture, industry, plant and animal life and human survival. Water has been an economic resource and political tool since the beginning of human history. Carbon dioxide induced global climatic changes have affected water supply and distribution. The hydrologic cycle is an important component of the climate system and determines regional water availability. Precipitation and soil moisture storage add to sufficient water supply. Changes in precipitation due to an atmospheric warming represent a key factor in the study of potential climatic impacts on water supply and hence food shortages. Precipitation is the world's prime source of all fresh water. However, sea levels rise and more frequent and severe storm surges are projected to increase flooding of coastal areas and accelerated coastal erosion. Sea water intrusion into fresh water sources and drainage problems in low lying land will disturb the fresh water sources for the world population.

2.7 Impact of climate change on human health and diseases

Diseases and epidemics constitute another very important factor that must be studied in the context of potential carbon dioxide induced climate changes. Altered climate patterns including increasing precipitation and ground water and seasonal temperature extremes could critically affect breeding conditions, growth rates and biological diversity of many species including parasites affecting humans and animals. Schistosomiasis, Bacillary dysentery and Hookworm are typical diseases that thrive and spread in warm temperatures and as a result of global warming, they are already increasing. There will be multiple impacts on human health in a warmer world. More frequent and intense heat waves will increase illnesses and deaths from heat stress and this is made worse in urban areas because of lower air quality resulting from high temperatures. Victims are principally from older age groups and

the urban poor who cannot afford air conditioning facilities. More natural disasters are already taking place because of increased frequency and intensity of floods. Droughts and storms will raise the risks of deaths and injuries directly to both humans and animals. Serious indirect threats to health from such events include loss of shelter, population displacements, contamination of water sources, hunger and malnutrition and higher risk of infectious disease epidemics.

Warmer temperatures are projected to increase incidents of water-food and vector borne infectious diseases. Urban Cholera outbreaks may increase as a result of higher frequency of both floods and droughts because of contamination of water sources by floods and unhygienic sewer reticulation practices during water shortages. In areas where public health infrastructure is weak or deteriorating, higher temperatures will cause expansion of Malaria transmission zones to higher altitudes and possibly higher latitudes that have been free from mosquitoes. The transmission season may also be extended in some locations. Climate change is projected to result in a net increase from the current forty percent in the proportion of the world's population living in areas with malaria. In Africa the number of people exposed to malaria per month is projected to increase by 16-28 percent by the year 2100 because of climate change (Patz et-al 2015:19). Poor food supplies in developing countries because of reduced crop yields and increased impacts of extreme poverty are expected to increase malnutrition and as a result many people will succumb to diseases. Climate change is therefore expected to increase the number of under nourished people in developing countries currently estimated to be around 800 million people (Patz et-al:2015). Malnutrition is a direct cause of stunted physical and intellectual development in children, low productivity in adults and susceptibility to infectious diseases. Climate change thus threatens to deepen human constraints on development.

2.8 Human settlements, energy and industry

Alterations in human settlement patterns come as a result of the warming of the earth's surface and consequent shift of deserts and rainfall patterns as well as from a changing sea levels. The effects of climate variability and fluctuations on migration are amplified in developing countries by their proximity to physical and economic margins of regions where growth and development can take place. A number of

circumstances that are contributing to the exodus of people from rural areas are related to the natural environment, the physical factors such as the soil fertility, annual rainfall, temperatures, pests and diseases are among other climate and meteorological disasters which make life difficult for inhabitants of such areas by exposing them to hardships and dangers and by reducing the size of harvests, damaging crops and decimating livestock.

Physical infrastructure in villages, towns and cities, industry and energy systems are already affected by climate change. Flood damage to homes and buildings in low lying lands are set to increase because of higher flood frequency and sea level rise. Damage by storm surges and winds will increase as cyclone frequency and intensity rises. Threats to energy distribution systems, water supply and treatment systems, industrial facilities and commercial properties are similar and pose great dangers to sustainable development. Concentration of infrastructure in large cities place higher values of physical capital at risk but smaller centres including villages are often less well protected and insured and therefore more vulnerable.

Rising damage to infrastructure combined with changes in the availability of resources and the demand for goods and services will disrupt key economic sectors that sustain settlements. In common with historical experience, degradation of rural livelihoods, especially because of the depredations of more frequent droughts is likely to prompt migration to towns and cities. The size and characteristics of urban populations may therefore change putting major strain on urban services and infrastructure. In developing countries, informal settlements are likely to grow aggravating social disparities and health risks and deepening urban poverty.

2.9 Impact of climate change on insurance and financial services

Direct economic losses from climate based disasters increased ten-fold between the 1950's and the 1990's and are still on the rise (Kellogg and Schware 1991:26). Increased frequency and intensity of floods have caused much damage to property for example the recent cyclone Denio which has caused global destruction of property. Climate change is expected to increase uncertainty in the insurance sector causing premiums to rise and making some risks uninsurable. Expansion of the insurance sector into developing countries will significantly slow down and become

costlier, beyond the reach of many people. Constraints on risk spreading strategies will thus tighten at the same time risks of weather related disasters are increasing. Reliance on governments and relief programmes to fund compensation and rebuilding after natural disasters will grow unless the damage and costs of climate related disasters can be reduced through better planning and preparedness. Increased frequency and intensity of extreme events because of climate change will be very costly in future and will be a significant cause for economic instability in developing countries especially between the rich and poor.

2.10 Impact of climate change on poverty reduction

Economic analysis of the impact of climate change has estimated that for developed countries, global warming of up to a few degrees would produce a mixture of economic gains and losses with losses increasingly predominant for larger increases in temperatures (IPCC report 2007). In developing countries in contrast, impacts on economic welfare are estimated to be negative for even small amounts of warming and are set to decline further with more warming because of poor adaptation strategies and coping mechanisms. People's welfare in developing countries will also be affected more severely because of lack of infrastructure and resources which impacts on human health and mortality, water availability and quality, ecosystems, goods and services. Climate change is set to increase the disparity in well-being between developed and developing countries and the more the world warms, the wider this gap will become. Poor people and poor countries stand to lose the most because of climate change.

Figure 2.6. Rural and poverty stricken community in Hurungwe.

Photograph taken by this researcher.

Climate change impacts are projected to be damaging in developing countries because their economies and livelihoods are often highly sensitive to climate change. Further to that, adaptive capacities are very low. Where people and national economies depend heavily on natural resources such as land and water as is the case with Zimbabwe, they will be hit hard by increased droughts and flooding or by lower productivity in agriculture. For example, the majority of the workers in Sub-Saharan Africa work in agriculture and as a result more people are vulnerable.

The ability to cope with the consequences of climate change by taking advantage of potential opportunities or moderating damage is determined by adaptive capacity but in developing countries, adaptive capacity is poor due to lack of adequate climate change information and capital. Developing countries very often lack adaptive capacity because of meagre economic resources, corruption, lack of access to technology, information and skills, poor infrastructure and weak governance institutions. Poor people are often disadvantaged most by these inadequacies. Low adaptive capacity combined with high sensitivity to climate change leaves developing countries and poor people highly vulnerable to the damaging impacts of climate change. As a result, poverty alleviation becomes very difficult.

Climate change will continue to weaken the livelihoods of poor people especially in developing countries by eroding their livelihood assets.

Climate change threatens to cause losses of:

- **Physical capital**: physical capital is lost because of increased damage and destruction of shelter and infrastructure and the expansion of urban squatter settlements.

- **Human capital**: this is due to the increase in deaths and injuries from extreme events, increase in infectious diseases and the breakdown of knowledge linking culture and the environment.

- **Social capital**: this is caused by the weakening of traditional risk-sharing strategies by the breadth and longevity of impacts and migration out of affected areas.

- **Natural capital**: this is caused by massive degradation of water resources and ecosystems, loss of bio-diversity and lower productivity in agriculture.

- **Financial capital**: this is because of the higher losses through natural disasters reduced economic growth and lower incomes (Smith 2006:70-71).

Degradation of people's livelihoods by climate change will leave poor people with less asserts that they need in order for them to be able to withstand and recover from shocks and stresses of land degradation and climate change. Climate change will deepen poverty and make the escape from poverty even more difficult. The nexus between climate change and poverty will thus be harder to beat in the developing world. The poor people's income will shrink, basic commodities will fall out of reach for the poor families, diseases will increase and investment in safe water and sanitation will get riskier and even more expensive.

2.11 Conclusion

It can be noted as afore-mentioned that the climate change problem is a direct consequence of human action on nature. All the literature reviewed has shown that unsustainable means of production especially the use of fossil fuels has led to the accumulation of carbon dioxide gas in large amounts into the atmosphere. This is the major cause of climate change. As carbon dioxide continue to accumulate in the

atmosphere, the heat that is radiated from the sun is blocked from rising into the atmosphere and is reradiated back to the earth leading to warmer climatic conditions.

This chapter has also outlined some of the notable impacts and dangers posed by climate change. Climate change has been the chief cause of increased cases of malnutrition coupled with poor agricultural facilities in most developing countries. The erratic patterns in which rain has been falling is cause for concern. In some areas no rainfall is received at all while in some areas floods are experienced and this has greatly affected crop yields. Further to that, heavy flooding is affecting sources of clean water. In most cases salty sea water is carried into clean water bodies because of flooding. As a result, this will force a lot of people to migrate to places with clean sources of fresh water and this will put more pressure on land and scarce resources as well as overpopulation in some areas.

High temperatures are responsible for the rise of disease causing organisms which thrive in warmer temperatures. Most of the diseases causing vectors breed well in warm temperatures which are caused by climatic variables. Both human and animal species are affected. Further to that the spread of diseases and epidemics are set to rise if no action is taken to avert the problem. More so much money will be spent is purchasing medicines at the expense of other developmental programmes and the cost of medical care is set to rise beyond the reach of many poor people in developing countries. As a result, the effects of climate change will hinder meaningful global sustainable development if they are not addressed.

Chapter 3

The land and its people

3.1 Introduction

This chapter shall give a detailed description of the area under study, climate and vegetation, demographics and the livelihoods of the inhabitants. It shall also examine the religious beliefs, practices, world views and polity of the Shona people. Shona attitudes to nature shall be explored by focusing on animate and inanimate beings which include animals, plants, and water among others. Christian attitudes to nature shall also be explored looking at those attitudes that engender positive environmental conservation and those that are not. Activities done by Shona communities shall also be explored.

3.2 Description of the area under study and its inhabitants

Figure 3.1 Provincial boundaries of the area inhabited by the Shona people.

Source: Zimbabwe climate office.

The map above shows the provincial boundaries of the area that is focused by this study. With the exception of Bulawayo metropolitan, Matabeleland north and Matabeleland south provinces and the western parts of the Midlands province, the rest of the country is inhabited by the Shona people. Much of the area is high land save for the Zambezi valley in the border with Mozambique to the north and the Low-veld to the east. Almost all the rivers drain their water into the Zambezi to the north and the Limpopo to the south. Pungwe river drains direct into the Indian Ocean. There are many mineral deposits like gold in areas including Mazoe, platinum in Ngezi area in Mashonaland West Province, diamonds in Marange area in Manicaland Province, iron ore in Mwanesi in the Midlands Province, coal in Hwange in Matabeleland North Province.

3.3 Climate and vegetation

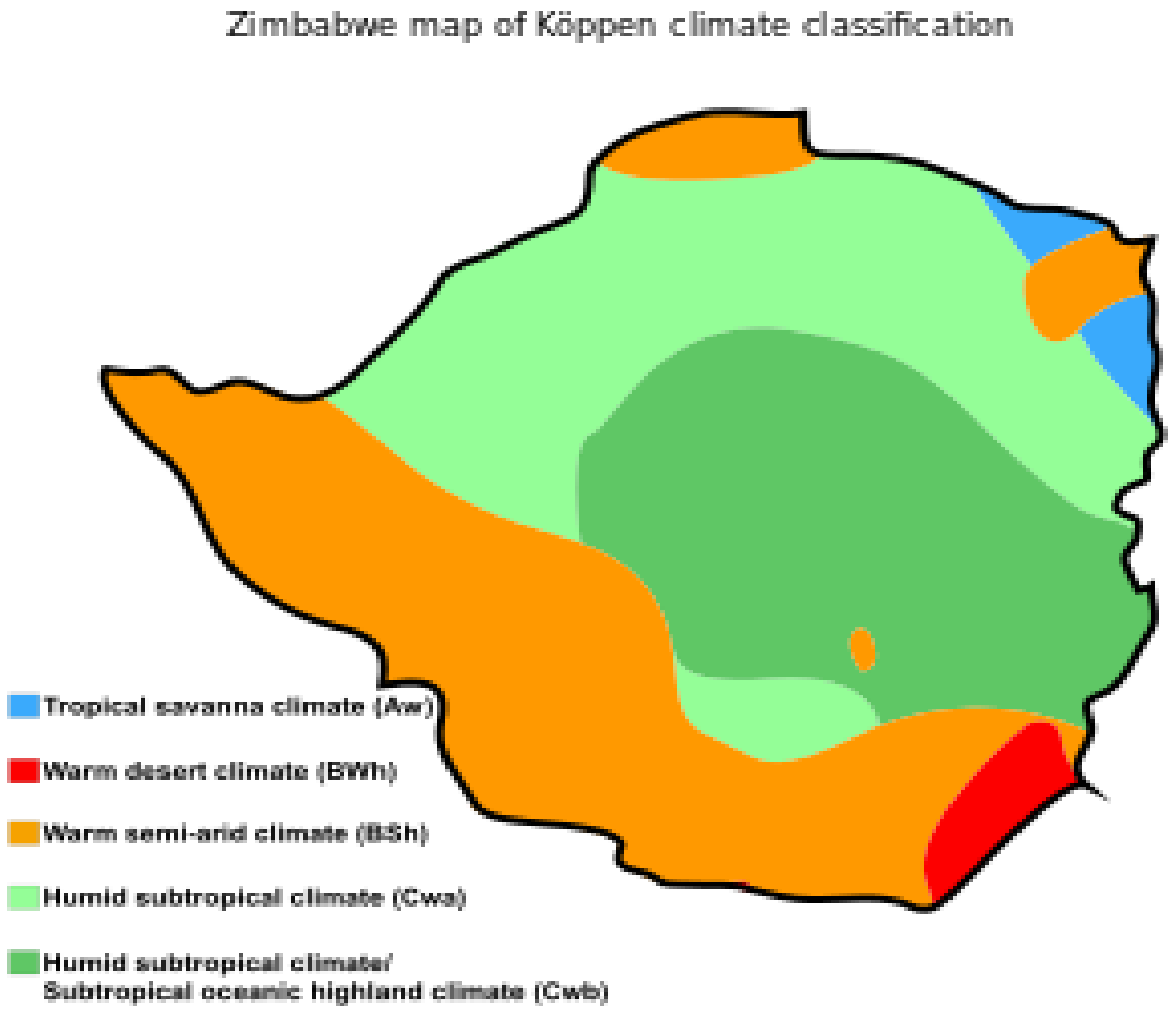


Figure 3.2. Showing climate conditions of the area under study.

Source: Zimbabwe climate office.

The climate of the area under study is markedly varied by altitude. It is dry and tropical and is divided into four seasons namely the rainy season which stretches from November to mid-March, the post rainy season from late March to mid-May, the cool dry season from mid-May to mid-August, and the warm dry season from mid-August to November. The rainy season is typically a time of heavy rainfall. The whole country is influenced by the Inter-tropical convergence zone especially during the month of January (www.fao.org). In years when it is poorly defined, there is below average rainfall and a serious likelihood of drought (ibid). Most of the rains fall in summer season. It is brought by the Zaire winds from the north-west that is conventional rainfall formed from hot air rising and the south-east trade winds which brings relief rainfall formed from air rising over the mountains especially in the eastern border.

Rainfall and temperature conditions in the study area are greatly affected by relief and altitude that is the height above sea level. Temperatures are chiefly affected by latitude, the distance from the equator and altitude (Munowenyu and Murray 1999:11). Normally places in low latitudes have high temperatures. The Zambezi valley which covers the area between Zimbabwe and Zambia to some parts of Mozambique and the Low-veld to the east are low lying areas with very high temperatures. The rest of the area in the central region have high altitude and have low temperatures.

Since Zimbabwe has fairly high altitudes, the influence of latitude on temperatures is not very strong. Using the average annual temperatures, three broad belts can be seen, firstly the hot region which include the Low-veld and some parts of the middle-veld and the temperatures are above 20 degrees Celsius (ibid). Secondly, there is the warm region which covers the rest of the middle-veld and virtually all the high-veld. The temperatures in this region range from 15 to 20 degrees Celsius. Thirdly there is the cool region covering the highest parts of the country especially the eastern border highlands with average temperatures ranging from 15 degrees

Celsius and below but drastic changes have taken place with increased dry seasons with very hot temperatures.

Vegetation cover in Zimbabwe as indicated in graphs in chapter 1 has greatly depreciated from early 2000 onwards. Zimbabwe is made up of a series of plateaus and mountains. In the central parts of the country is the high-veld ridge which stretches from the south west to the north east occupying an area of around quarter of the country (Munowenyu and Murray 1999:68). The middle-veld has areas of wooded savannah and bracken covered hills and enjoys temperate climate. Either side of the middle-veld are low lying regions along the Limpopo valley to the south and the Zambezi valley to the north. These low lying areas are very hot and dry. In these dry hot low lying regions, Mopane and Baobab trees are common across the scrubland (Munowenyu and Murray 1999:68). The quick growing eucalyptus trees have also been introduced to provide wood for energy and to act as windbreaks in farms.

Deforestation and widespread cultivation have cleared much of the natural vegetation in the area under study. The approximate 10 percent of the land has been set aside for parkland and natural habitats and are preserved as national parks (Munowenyu and Murray 1999:70). The government acquired 12.4 million hectares of the 16 million hectares in large scale agriculture from 6796 large scale farms (www.fao.org) which resulted in the emergence of AI and A2 model farmers. A total of 127 192 households were settled under the A1 model with each household acquiring 6 hectares of land. The A2 model comprised of self-contained farming units and 12 942 individuals were allocated large tracts of land above 300 hectares. This signalled the great fall of forested land as the newly resettled farmers cleared land for agricultural purposes. Coupled with poor farming practices, land degradation reached its crescendo peak. Chemicals that were used to control weeds found their way to the river systems polluting water bodies as indicated in chapter 2.

3.4 Demography and livelihoods

It is critical at this point to explore the demography of the study area since it has some effects on the environment and its inhabitants. Demography is the science of human population dynamics which encompasses the study of the size, structure and

distribution of populations and how populations change over time due to births, deaths, migration and aging (https://www.demogr.mpg.de/en). Demographic indicators are important and informative in explaining world events and they should be turned to first in order to come up with definitive environmental solutions (https://www.demogr.mpg.de/en). Population increase has adverse effects on the environment. The expanding population the world over has resulted in increased competition for natural resources, food, land and many others.

At the beginning of the twentieth century, the population of the country was estimated to have been around 600 000. In 1992, population census estimated it at over 10 000 000 people. Currently the population is estimated to be above 16 million people and around 70 percent of the population live in rural areas and the rest in urban areas (www.zimstat.zw). With a population above 16 million over an area of approximately 390 757km^2, it is evident that the demand for resources is higher. Shona is the largest ethnic group about 77 percent of the population consisting of the Karanga, Korekore, Manyika, Ndau, and Zezuru dialects. The second largest ethnic group is the Ndebele consisting of about 18 percent. Other minority groups like the Batonga in the Zambezi valley, Hlengwe in the Low veld and Venda in the southern border with South Africa each constitute 1 percent while Asians and Europeans constitute 2 percent (ibid).

Three major demographic and settlement changes occurred with the coming of the British settlers around 1896. First, the acquisition of large tracks of land by the white settlers for commercial agriculture until the 1950's resulted in a situation in which much of the land was owned by well under 1 percent of the population with limited access to vast majority of the rural population (https://www.demogr.mpg.de/en). Secondly, during the colonial period, the development of industry in towns and cities especially Harare and Bulawayo meant that men were to migrate to urban areas leaving women and children in rural areas. The third major change involved the age profile of the population. A sharp drop in mortality rates and longer life expectancy between 1960 and 1992 meant the population sharply increased (ibid). The huge population meant increased demand for land, food production and the pressure was burdening the environment.

In the year 2000 after the formation of the powerful opposition party, the Movement for Democratic Change (MDC), the then governing Zanu PF party embarked on the Fast Track Land Reform Programme and acquired large tracks of land and gave to landless blacks. Though the move to acquire and redress land imbalances was a noble idea, the way it was done was chaotic. Now almost every piece of land is occupied. Forests were cleared for agricultural purposes and the cutting down of trees to cure tobacco has risen to alarming proportions.

- Livelihoods

The macro-economic challenges in the study area continue to worsen. Life is getting harder by the day for ordinary people than what it was two decades ago (Magura interviewed on 07/03/17 in Harare). Zimbabwe had never recovered fully from the economic slump that began in 2000 with the violent seizure of thousands of white owned farms with unemployment rate running as high as 80 percent (Magura interviewed on 07/03/17). Even those with jobs still suffer unpaid wages and acute shortages of cash. This has led to significant retrenchments in the formal employment sector. Income security has dwindled heavily such that the majority of the people now rely on agriculture and other related subsectors for sustenance. Livelihoods are mostly dependant on rain-fed agriculture with only a few commercial farmers doing both dry land and irrigation farming.

Figure 3.3. 2017 tobacco crop under irrigation in Hurungwe.

Photograph taken by this researcher.

This is one of the few remaining white commercial farmers who remained after the year 2000 land reform programme able to irrigate crops. The majority of blacks who acquired land from the minority white farmers do not have the capacity to irrigate their crops and thus rely solely on rain-fed crop production.

The study area is subdivided into natural farming regions. Natural region 1 covers Chipinge and Mutare in the eastern border with Mozambique and receives more than 1000mm of rainfall per annum providing a suitable regime for intensive agriculture and forestry. The region is relatively cool with average annual temperatures around 15 degrees Celsius or less. In this area major crops are tea, coffee, vegetables along with dairy farming. Natural region 2 covers central Harare and parts of Mashonaland east and west provinces and is divided into two sub-types. Sub region 2a receives high rainfall nearly 1000mm per annum. Mainly commercial rain-fed agriculture is characterised by tobacco farming, maize production, cotton and winter wheat which is irrigated. Much of the area is on high plateaus such that winter temperatures are moderated. Sub region 2b has less reliable rainfall between 750-1000mm per annum. Again rain-fed agriculture is practiced supplemented by spray irrigation. Crops grown in this sub region are similar to crops grown in sub region 2a. Natural region 3 covers much of the Midlands and is favourable for semi-intensive cultivation with rainfall averaging between 550-800mm per annum. The rains are often characterised by heavy storms. In mid-season, dry spells are common. Most cultivated crops in this region are drought resistant for example cotton, soya beans, sorghum and millet among others. For commercial production of crops like maize, irrigation is required.

- Gold panning

Gold panning is another form of livelihood for the majority of people in the area under study especially in rural areas. Since the year 2000 when the economy of Zimbabwe declined, a lot of people resorted to gold panning in order to make a living in a country with deteriorating economy leaving a trail of destruction on farmland, forests and the entire environment. The majority of farm workers were left with no option since their employers, the white farmers' land was repossessed for distribution to the landless blacks, have also turned to illegal gold panning.

The gold panning activities had its own share of problems on both human life and the environment. Deep tunnels have been dug beneath major roads and cities especially the town of Kwekwe in the Midlands province. Before independence in 1980, Anglo-Saxons and other British miners followed proper mining ways but with the coming of gold panning, those pillars that were left to hold the earth from falling closing mine tunnels were destroyed and a lot of gold panners died. Further, in almost all the provinces, the environment was degraded to alarming levels due to poor mining techniques. Trees were destroyed, rivers and water bodies were contaminated with mercury which is used to trap gold and this has gone unchecked for some time.

- Vending

Vending is another form of livelihood that has taken its toll in Zimbabwe. In the research that was conducted by Ndiweni et al in 2014, the informal sector is fast growing in line with the rate of unemployment as people seek ways to sustain themselves (Ndiweni et-al 2014). It is estimated that more than 30 000 students graduate from universities and colleges every year to join millions of unemployed people (ibid). All the cities and towns are congested with vendors. People selling their wares are seen everywhere in urban areas. This has been necessitated by the collapse of industries that used to employ many people. This form of livelihood had its own problems. Money vending has seen a lot of people struggling to get cash. In the streets money is sold at 20 percent interest, as a result, the black market is rising. With such a scenario, it is difficult for people to work towards sustainable development programmes in order to fend for their families.

On the other hand, firewood vending is also on the rise. Trees are cut in large numbers to sell firewood. The problem has been furthered by the erratic supply of electricity power. In all urban areas, wood has been an expensive commodity that people resort to when power is cut off.

Figure 3.4. Vendors selling of firewood in Mabvuku high density suburb in Harare.

Photograph taken by this researcher.

This form of livelihood has had a negative impact on the Zimbabwean forests. Since 2000 when the economy began to fall, dependence on wood fuel has been rising and presently firewood is being sold in every town. This has seen the clearing of vast forests even under the watch-full eye of the Environmental Management Agency (EMA). Corruption is one of the hindrances to successful environmental protection. Those who destroy forests easily evade prosecution and most of the culprits conduct their business during the night.

Cross border trading is also on the rise. The majority of families are earning a living form selling goods imported from countries like South Africa, Zambia, Tanzania, Botswana and as far as China and the United Arab Emirates. This has also contributed to the poor retention of foreign currency because the imports by far outweigh the exports. Only a few people are formally employed in government and the private sector constituting about 20 percent.

3. 5 The Shona people

The Bantu speaking peoples first moved into the central area between the Limpopo and Zambezi rivers what is now called Zimbabwe some two millennia ago (www.encyclopaediaofreligion.com). The term Shona is applied to the indigenous inhabitants of this region excluding the two western provinces of Matabeleland north

and south which are inhabited by the Ndebele speaking people. The Shona people are often classified according to their four main dialects which are Karanga spoken mainly in Masvingo province to the south and parts of Midlands province, Korekore spoken mainly in Mashonaland central and parts of Mashonaland west provinces to the north, Manyika mainly spoken in Manicaland province to the east, and Zezuru mainly spoken in Mashonaland province to the north-east. The Shona people are the dominant ethnic group in Zimbabwe comprising of about eight million people which is about four fifths of the country`s population.

By the end of the nineteenth century the period when the British colonisers arrived, the Shona comprised of many small chiefdoms and lived in scattered villages based on patri-lineages. They subsisted mainly on agriculture and rearing of livestock especially cattle which had significance in marriage payments and for religious purposes. Presently more than half of the Shona population claim affiliation to some Christian denomination and Christian beliefs have infiltrated the thinking of professing traditionalists. However traditional beliefs and practices are still dominant even among many professed Christians (Zimombe interviewed on 10/05/17 in Gokwe).

Shona religion traditionally focuses on the relationship between the living, the spirits of the dead whom Mbiti (1996) refers to as the living dead, and the creator God locally known as *musikavanhu* which translates to God the creator. This is a vital component of the Shona religion and constant communication with the spirit world is respected and is done through rituals (Spirit Medium Majokoro interviewed on 10/05/17 in Guruve). These include the spirits of strangers, deceased ancestors, ancient heroes, spirits of the land and a high God who is known by a variety of names who is too remote to be concerned with the affairs of humans and only accessible through rituals. This fervent belief in spirits has helped the Shona people to live in harmony with the environment since the spirits are believed to be the custodians of the land and they will punish those who degrade the land.

Shona religion owns a lot of spiritual and religious belief systems. Some of these belief systems have been lost or altered and many traditions have been lost and some replaced by secular and religious traditions of immigrants and colonisers, a

major setback on the Shona religion. As a result, many of the sacred environments like the *Dambakurimwa* alluded to in chapter 1, which are believed to be the abodes of nature spirits or which are sacred places of learning about traditional healing, divination and rites to connect with the ancestors have been destroyed by mining, deforestation, construction of dams and cultivation of commercial crops (safcei.org/faith-perspectives). Due to the foreign influences and impacts, indigenous belief systems and knowledge are being forgotten. Modernity has seen many Shona people giving up most of their traditional ways of life in favour of Western education, capitalist enterprise, foreign religious practices and prioritising the individual over the community (ibid). Is it not ironic that the global environmental crisis, which is particularly harshly expressed in Africa, is resulting in a growing interest in traditional African knowledge systems and of how communities lived in a sustainable relationship with their environment? It can therefore be argued that, traditional spiritual values attached to land and water give some insight into a practical African religious environmental ethic.

J.S. Mbiti (1975:59) states that Africans are, “notoriously religious”, implying that religion permeates and is integrated in daily lives of the Africans with no clear-cut separation between what is secular and what is religious. Despite widespread criticism of this statement, religion is part and parcel of the lives of African people. In the Shona world view, religion focuses on the preservation of human well-being and the promotion of whatever enhances life on earth. For the adherents of Shona religion salvation is here and now and as such humanity must enjoy life to the full. At a practical level, a healthy natural environment is acknowledged as essential for a healthy and harmonious life of all beings and the connection is deeply spiritual (ibid). According to the Shona world view, nature is a gift from the creator for the benefit of humanity who should use the environment sustainably.

Religion is part of the cultural heritage of the Shona people and by far the richest entity in Africa and is found in all aspects of human life. It has dominated the thinking of African peoples to such an extent that it has shaped their cultures, social life, political organisation and economic activities (Mbiti 1975:10). Religion is closely bound up with the traditional way of African life and vice-versa. Shona religion was not brought from outside like other practiced religions but is rooted in the African soil.

It is the product of the thinking and experiences of African women and men who formulated religious ideas, beliefs and practices based on the life situations and circumstances they faced to safeguard the life of the individual and that of the community. These religious ideas were in response to life challenges that humanity faced and they have worked very well in cementing social bonds and harmony in the community. In Shona religion, beliefs are an essential component as they help in giving honour to sacred objects and places that are set apart. Sacred shrines like the Nevana shrine in the Midlands Province in Gokwe, pools like the Mushumbi pools in Mashonaland Central Province in Guruve, hills or mountains like the Nyanga mountains, rivers among many more are preserved with due care.

Safeguarding of these sacred places is enabled by set morals and values. It is believed in many African societies that their morals were given to them by the creator God called *Mwari* from the very beginning. This therefore provided an unchallenged base for the morals. It is further believed that some of the departed and the spirits keep watch over people to make sure that they observe the moral laws and are punished when they break them deliberately (Spirit Medium Majokoro interviewed on 10/05/17 in Guruve). This additional belief strengthens the authority of the morals. Since morals of each society are embedded in its customs, traditions, rituals, beliefs and practices, people assimilate them as they grow up and become participant members of their community (ibid). This is the part of religion which deals with the ideas that upholds the life of the people in their relationship with one another and the world around them. Values and morals cover issues like truth, justice, love, right and wrong, good and evil, decency, respect for life and property, character, and integrity among others. They help humanity to live well with each other, settle differences amicably and to maintain peace and harmony and make good use of their belongings and to have a good relationship with their total environment.

African people in general and Shona people in particular take moral life seriously (Magesa 1998:34). Through myths, legends and beliefs, they show that from time immemorial, humanity enjoyed happiness, peace, prosperity, and well-being by keeping moral demands of human conduct (Mbiti 1975:179). These beliefs and practices were directed towards strengthening the conduct of society.

The resilience of Shona religion is partly due to the role that is played by religious officials. These are the people who conduct religious matters such as ceremonies, sacrifices, formal prayers and divination. In most cases they are trained women and men who are well versed with religious affairs and are respected by the community and these include the *mhondoro* that is the spirit mediums. They hold offices such as priests, rainmakers, diviners, kings and many more (Spirit Medium Majokoro interviewed on 10/05/17 in Guruve). Without these figures, religious activities would neither exist nor function properly and much of the religious wisdom in people would be forgotten. They are the human keepers of the religious heritage. They are an essential part of Shona religion since without them it will grind to a halt and people would not benefit from it in practical terms.

3.6 Shona traditional polity

The social and political organisation of the Shona people being influenced by religion plays a pivotal role in shaping and strengthening these people's attitudes. In Shona religion, well-being and cosmology, there is a causal connection between the community and its physical environment (Dewa interviewed on 10/05/17 in Hurungwe). Among the Shona, the real owners of the land and all that is on it is the tutelary spirit *Mwari* that is the creator God and the various territorial ancestral spirits. As such the land belongs to the spirits and is considered sacred. It is sanctified by its possession by spirits whose remains are interred in it (ibid). According to Ranger (1967:18), the system of the spirit mediums expressed the common African idea that the increased power of the dead, of their ability to communicate more freely with the divine, and of their role as protectors of the land and the people is respected. The dead are thought of forming tender bridges between the living and the divine and thus maintain harmony with the environment.

The top to bottom hierarchy of the Shona polity starts with the paramount chief who in most cases have two or three Headmen under his jurisdiction. The paramount chief controls a vast area with clearly marked boundaries like rivers and mountains. For the Shona people just like in most indigenous societies in Africa, land has primarily a value linked to a tribe, its chief and the spirits. This is the reason why the Shona chief is often called the owner of the land (Taringa 2014:39). This ownership of the land by the chief is a result of his connection with mythological founder-

ancestors of his chiefdom. It is the ancestors who are believed to have chosen and gave the authority to the chief over his subjects (Bourdillon 1997:58-64). As such his authority is unquestionable and is also enshrined in the constitution of the country. Traditionally, the chief is the final court of appeal and is responsible for propitiating his clan ancestors. Matters are brought to him to make judgements especially those that his headmen would have failed to handle (ibid).

Below the paramount chief are the Headmen who wield considerable political power over those whom they lead. The headmen's territory consists of villages where village heads are in charge of leadership roles. In most cases the headman can oversee up to ten villages. The headman presides over court issues under his area of jurisdiction and those issues beyond his control are brought to the paramount chief for settlement (Manhenga interviewed on 15/05/17 in Karoi). At the bottom is the village presided over by the village head. This consists of family units that number as much as fifty households. The village head allocates land to family heads and adults. He also settles domestic and minor disputes and sees that ritual obligations are followed punishing those who break the rules. In most cases a cow or a goat is paid depending on the gravity of the offence (ibid). The village head is also a religious leader especially in rain-making ceremonies and he addresses ancestors on behalf of his subjects.

3.7 The Shona people's attitudes to nature

In order to establish clearly the Shona attitudes to nature, the following aspects shall be dealt with: the land, water and trees, forests and animals. In Shona society, religion has always been a source of environmental preservation and played an integral role by linking people to their environment and thus imbue them with knowledge and values that make caring for the environment a priority. Religion occupies a unique place in ascertaining environmentally friendly attitudes. Spiritual attachment on all visible things is key in safeguarding the environment.

The basic tenets of Shona attitudes to nature are best reflected by its worldviews that put great emphasis on the spiritual realm. The Shona world view implies the African concept of pan-vitalism that is the belief that the universe has life, it is not a lifeless entity but it is alive (Taringa 2014:47). The myths that explain the origins of

human beings like the *gurauswa* myth shows that all things originated from the same ancestors. Therefore, like most Africans, the Shona people are kin to all creatures, gods, spirits and nature (ibid). The spirituality of Shona religion is very important in ecological conservation.

Shona religious beliefs play a pivotal role in determining the positive values and attitudes towards nature and should be crucial components of any efficacious environmental policy involving Shona community. Religious taboos and restrictions could take the place of scientific explanation of environmental degradation (Bishau 1997:48). In Shona worldview, human beings and nature are bound together by one moral order and the ultimate sanction for morality resides in the sacred authority.

In contemporary Shona worldviews and perspectives, there is a dichotomy between the secular and religious phenomena. However, people's views of the universe has changed significantly especially with the dominance of Christianity over paganism, that is belief in many gods and the influence of Western worldviews. As a result, humanity has tended to alter and exploit nature beyond the limits of its resilience. Human activities which are linked to excessive demand for natural resources and over population, among other things are blamed for environmental degradation.

Given the significance of human behaviour as a major driving force of most ecological problems, it is generally agreed that efforts to promote global ecological and economic sustainability must include attempts to understand religio-cultural and public perceptions of the people and their attitudes towards the environment. The world today is currently witnessing major changes in the atmospheric conditions. These conditions are unbearable to both humans and animal species such that these conditions are having negative impacts on both aquatic and terrestrial lives to the extent that if no action is taken now, survival on planet earth hangs by the thread. For example, copper mining in Zambia emit arsenic into the air and water at levels 16 times higher than legal limits (https://globaljournalist.org/2013). Therefore, a critical consideration at the issues of the environment from the traditional Shona religious perspectives, with the view of ascertaining the orientation of people to environmental preservation and how such an understanding could engender sustainable development and environmentally friendly attitudes is important. The

reason why this is important is that, sustainability of life is nearing dangerous levels which must be corrected now.

Traditional African ecology like everything else in Shona society is inseparably linked with traditional religion. Environmental protection is sanctioned by God as its creator and the ancestors of the land. Shona religious ideas are very much about relationships whether with other human beings, the “living dead”, animals, cleared land, or the bush. The idea of totemism among the Shona people is a principle that seeks to create a cosmology that takes the existence of non-human entities seriously. The Shona people have been long known for traditional practices which are profoundly ecological. For example, by attaching sacredness on forests, that minimised the rate at which forests were cleared for pasture and agriculture.

Urbanisation and agriculture are some of the factors leading to the destruction of woodlands. However, some woodlands survived. The figure below survived urbanisation because it was first proposed as a protected green-belt area in 1910 against the call for suburban development (www.mukuvisiwoodlands.co.zw). The area has helped in educating school children on the importance of environmental conservation.

Figure 3.5 Mukuvisi Woodlands near Harare Central Business District covering 263 hectares of land.

Source: Mukuvisi Woodlands office.

For example, sacred woodlands in Guruve area in Mashonaland central province are now in a sorry state. About 81 percent of the informants felt that the coming of Christianity and the Western ideas destroyed the sacrality attached to the woodlands and people cleared the forests without hesitation. The blame is that Western ideas that only God is sacred and not nature led to the breakdown of indigenous attitudes towards nature.

In promoting life, Shona religion is closely connected with the environment because it is through a healthy environment that life is enhanced. For example, in the event of a drought Shona belief holds that something of spiritual nature is wrong and action has to be taken. The local traditional leadership is quick to summon all his subjects to a gathering called *dare* to discuss a way forward and to make amends with the wounded environment. Action is taken very fast and correctional processes are done. That sense of urgency is lacking in this modern scientific world where political persuasions and economic gains hinder meaningful progress and urgent action to work towards a sustainable developmental approach.

Shona religion has been relegated as if nothing environmentally meaningful could come out of it. The way Shona religion has been studied leaves a lot to be desired. For example, Western scholars like Sir R. Burton who studied African religions in East Africa described Africans as uncivilised and still at the rude dawn of faith called fetishism, describing African religions as primitive, backward and idolatry (Okon, Simeon and Dimgba, 2013). Most of the traditional religions of Africa have been viewed and studied as static and archaic religions. However, an unbiased study of this religion shows that almost all Shona religious adherents go everywhere with their religion and this is the strength that can be tapped from the Shona traditional religion to address the climate change problems the world is facing today since it has clearly emerged that the climate change problem is an ethical problem that requires ethical solutions. As a practical religion, Shona religion involves many beliefs and practices, traditions and customs through which people express themselves in relation to their surroundings. Religious values beneath these beliefs, customs and traditions have helped people over long periods of time to have good relationships with the environment.

3.8 The Shona religious and sacral view of land and water

For the Shona people, the land and water are regarded as precious gifts from *Mwari* the great Creator. Shona people have a very strong connection with the land not only as an economic resource but also as a home and a place for sacrifice and offerings to God and the ancestors. This explains well the push behind the rise of Nehanda Nyakasikana, the revered spirit medium who master-minded the first Chimurenga, that is the war in the then Rhodesia against the British occupation which subsequently led to the armed struggle. The land was at the centre of the discussion even at the Lancaster House Conference in London on the 21 of December 1979 (www.panapress.com/The-Lancaster-House-Talks). This is just but one example how the entire African continent value land. When the Shona people and more specifically Zimbabweans struggled or fought for land they did not simply struggle or fight for economic gains but for social, moral and religious motives to retain that which had been unlawfully taken away from them (Magura interviewed on 10/05/17 in Hurungwe).

For the Shona people, land is a sign of ownership and identity. This explains where the placenta is buried to connect the new born with God and the ancestors and with the child's place of origin. Nobody is allowed to temper with the land whatsoever. In almost all ethnic groups in Zimbabwe, every mature man is supposed to have a piece of land allocated to him by his father or family elders for him to build his home and raise his family, grow crops to sustain his life and that of his family. Land was strongly connected to life therefore people had all the moral responsibilities to take care of it. As a gift from *Mwari*, Shona people attached great value on land. Land has religious significance and therefore is regarded as sacred.

Besides land, the Shona people regarded water as a symbol of life. Watering places were approached with great respect and most water sources belonged to the community. It was therefore an offense and an anti-social act to cultivate along those places and offenders were brought to justice at the chief's court. Trees around such places were not allowed to be cut and the vegetation was well preserved to ensure that water was not contaminated and the spirits of that area are not disturbed. In order to protect these places and water from being polluted by humans, myths, taboos, proverbs, idioms, and riddles were formulated to educate people about the

importance of those places and make people aware that such places must be preserved. This tradition helped in the preservation of the societal norms but nowadays these watering places have been turned into rice pads and maize fields by many people ignoring their sacredness hence the resultant effects of droughts. It can therefore be noted that attaching sacred value and reverence to natural objects and phenomena can help in preserving the natural world just as the Shona hold it. Perhaps based on this view, a new way for Christians can have the same effect on environmental conservation. It is therefore imperative to note that such religious traditions should be upheld as they are helpful in as much as the conservation of the environment is concerned.

-Trees, forests and animals

It has been indicated earlier that all created things have a spiritual force in them. Trees and forests are also believed to have spiritual attachment and are regarded as deeply spiritual entities. There are taboos that were developed that prohibited the unnecessary cutting down of certain trees and destruction of forests. In Shona cosmology, the belief in the sacredness of trees and forests is very strong. Sacred groves encompass vast mountain ranges and rivers and these places are habited by ancestral spirits who stand guard in these sacred places (Taringa 2014:52). Gelfand (1972:54) put it as follows:

> *"So strong is the feeling among the Shona that one entering a strange area in a forest, mountain or a beautiful spot, one is not allowed to comment on it lest he or she upsets the ancestral spirits of the region".*

Such sacred forests are called *dambakurimwa* meaning forests that must not be cultivated and *dambakutemwa* meaning forests whose trees must not be cut. It is morally wrong in Shona religion to cut down trees in sacred places. In this way, forests and woodlands are protected.

The Korekore people of Mt Darwin and Muzarabani valley in Mashonaland province bordering Zimbabwe and Mozambique consider the forest as a sacred place. In the forest there is a hut where the chief offers sacrifices for rain, fertility and new life for all on behalf of his community. So the forests are seen as places of abundant life,

places for reverence and honour to the extent that nobody is allowed to disturb the forests because by so doing, one is disturbing life. Sacrifices are offered to divinities, to God and to the ancestors who are venerated in Shona religion. Traditional Shona people worshipped *Mwari* the giver and sustainer of life in order to maintain the ecological balance. Through the traditional rites of the community, ceremonies, sacrifices and prayers, people established a good relationship with the environment. Such attitudes towards the environment are very positive as they ensure the conservation of the environment. Negation of these practices explains the reason behind recurrent droughts and deaths in humans and livestock, intimated the locals from Muzarabani area. There is need for the country to re-institute this lost legacy and the troubles befalling the people will be minimised. Close observation of this argument seem to be sensible because the modern world has been bent on destroying without replenishing the natural forests.

In Shona societies, all the animate beings are viewed as creatures of God, this explains why many myths and stories told use the animals as main characters. Animals are respected as part of the whole creation. Some ethnic groups like the Ndebele believed that fierce animals such as lions, leopards and buffalos were just a manifestation of the great power of *Mwari*. In the Ndebele kingdom when a lion was killed male children were put on the corpse in the belief that they mysteriously inherited its power and bravery. These animals were not carelessly killed and this helped in maintaining the natural balance of the ecosystem.

Shona people were able to relate to nature through totemism. Here certain taboos were attributed to certain animals, mountains, valleys, swamps, rivers and plants. The belief in totemism sets apart some animals, sacred groves or plants for certain kinship affinity, religious or medicinal purposes whose potency, value and efficacy were determined by their nature. These beliefs and taboos helped in environmental preservation because people refrained from using the natural resources carelessly. Some totemic beliefs and taboos attached to certain animals, trees and places helped in the preservation of some animal and plant species. For example, for the Korekore ethnic group, those who are named after the names of certain animals are not allowed to kill them or hunt them for meat (Spirit Medium Majokoro interviewed on 10/05/17 in Guruve).

However, the coming of Christianity signalled the collapse of these long preserved traditions as it demonised totemism as an un-Christian practice that had to be abandoned by those who converted to Christianity. With the emergence of such an attitude, the seeds of environmental degradation were sown in the African land. Today some Christian denominations go to the extent of rejecting their totems*/mitupo* as devilish and ungodly especially the new Pentecostal Churches in Zimbabwe like the End Time Message, to them, the issue of totems is demonic (Mazeya interviewed on 13/06/17). Such attitudes have led to the extinction of some wildlife species. A return to such traditions is a valuable move for environmental preservation. Korekore people consider themselves bound together by not eating these animals which they respect and this has helped in preserving animal species and the environment in general.

Virtually all large trees are protected as they are believed to belong to the ancestors. These ancestors are believed to dwell in these tree branches. According to Taringa (2014:54), the belief in ancestral spirits living in tree branches is implied in death rituals. In bringing back home the spirit of the deceased relative, the Shona people use tree branches of certain trees which are symbolically dragged from the deceased`s grave into the homestead (Taringa 2014:55). Some trees have religious significance like the *mubvumira/kirkia acuminata*, which are usually used to ritually mark the establishment of a new homestead and *muzeze/ peltoforum africanum* whose branches are used for ritual purification especially after events like burials and ritual washing to drive out *ngozi* that is avenging spirits (Daneel 2001:93). Trees that bear fruits also have religious significance. It is under these trees that ceremonies like the rainmaking locally known as *mukwerera* are conducted. Noteworthy is the fact that all these sacred trees have spiritual attachment on them and should not be cut for no apparent reason. In view of this fact, trees are preserved and only cut with ritual permission of the chief (ibid). Cutting down these trees without prior permission invokes the wrath of the ancestors. These beliefs and practices have preserved forested lands up until the advent of industrialisation and commercial agricultural production where large tracks of land were cleared for unsustainable economic gains.

In Shona societies, people believed that forests and trees stood as the manifestation of the supreme power of the creator God (Mbiti 1969:44). These were the ideal places where the sacred met with the profane, in other words communion with God was believed to take place in the forests. Shrines were erected in the forests for example the Matonjeni shrine in Matabeleland north province where the *Mwari* cult was practiced and the Nevana shrine in Gokwe Midlands province where the spirit mediums went to perform rain making ceremonies especially in times of drought. Trees such as fig trees, baobab trees among others were regarded as sacred. These trees together with vegetation around sacred places were preserved as sacred places of worship and sacrifice and therefore helped in preserving forests. The Shona people did not just attach much importance on trees for spiritual purposes but also because trees, herbs and plants in general were useful because of their powers in enhancing human life especially in times of sickness. These trees were seen as medicine to both people and the wild animals for they are endowed with medicinal qualities. As a result, careless cutting down of trees was greatly minimised.

In order to preserve trees, grasses and the entire vegetation in traditional Shona cultural settings, several taboos against cutting certain sacred trees or destroying the vegetation were formulated and legally endorsed by the chief. Medicinal trees were not allowed to be cut by uprooting the whole tree. Those with knowledge of traditional medicine will remove a small fraction of it like the roots, bark or leaves so as to give room for the plant to reshoot for further use by the community in future. Safeguarding of plants was a matter of concern and it was believed that if one cut such trees, misfortune befalls such individuals. Furthermore, it was regarded as an anti-social act that attracted a penalty from the community elders and traditional leaders. Therefore because of the importance attached on trees as having religious, physical, medicinal and cultural significance, it was the moral obligation of the entire community to preserve them. This again is indicative of the fact that Shona religious ethics cannot be ignored if the global fight against climate change is to make meaningful progress in enabling local people to be able to cope with climate changes.

More so, Shona people view themselves as part and parcel of the natural environment. Humanity is conceivable only in this cosmic environment. This web of

relationships is that which makes Shona people view the earth as their mother and sustainer of human life. This therefore meant that humanity and nature are interrelated. Plants, animals and all other non-living beings therefore, are part of nature which is a product of divine creation deserving to be respected as much as human beings who are also part of nature. So animate and inanimate beings form a unity and depend solely on each other for survival. This is the view that helps the Shona people regard themselves as being in close relationship with the entire cosmos, and collectively Africans are by nature nature-oriented.

In Africa, religions are not concerned with metaphysics but with this world (Okot p'Bitek 1993:73). People experience religion as being actively part of the experienced world. As a result, Shona people enforced practices that meant the good of the environment and in practice these practices should be considered in the global fight against climate change since they focus much on attitudes that do not harm the environment. For the Shona people, everything in life has something to do with religion because religion permeates into all the aspects of life so fully that it is not easy to isolate it. All of nature is invested with a mystical religious quality that unites the natural world and humanity. Everything in the world be it animate or inanimate forms part of a living community. This holistic understanding of reality holds that all elements in nature animals, plants rivers, mountains, caves among many more have religious significance and must be treated with respect.

Religion lives in the hearts and lives of the people who practice it. Humanity's inescapable bond with nature implies a heavy burden of responsibility for the conservation of the environment. Humans due to their ontological and even teleological position in nature are obligated to take care of the environment. The understanding that nature is God's creation implies that human beings have to take care of it as stewards. The contribution of religion will yield definitive results since people have close ties with nature.

Regardless of the globalisation trajectories that have been ushered in Africa, Shona religious practices are still a force to reckon with especially its influential elements such as *unhu/ubuntu* concept that can be exploited for the good of humanity and nature (Gathogo 2000:71). From time immemorial, it has been known that unwarranted

hunting and killing of animals in sacred forests that cannot be eaten and cutting down of trees for no apparent reason was regarded as an anti-social act. People are encouraged to make good use of the natural resources that satisfy their needs and avoid wasting resources. African culture has five major pillars which are economics, ethics, aesthetics, kinship and religion (Mugambi 2004:32). Of all these pillars, religion is by far the most important part of African heritage because it is found in all areas of human life. In other words, religion shapes people's culture, social life and politics. The strength of Shona religion is that it cultivates the whole person, provides people with a view of the world by providing moral values of right and wrong, good and evil, just and unjust, virtue or vice. These rules are there to govern the conduct of human beings in their daily lives and thus a plus in the preservation of the environment.

It was common to hear members of the indigenous communities calling non-human living beings "people", for example birds were called winged people, trees called standing people and fish, people who swim in the waters. This was not the result of limited vocabulary in indigenous languages but it was because all beings in the shared indigenous worldview were typically understood to be members of one spiritual family. From this perspective, humans live in a bio-centric as opposed to anthropocentric world. Humans are not thought to be at the centre of the world or superior to the rest of creation. It is therefore the human responsibility respect and live in harmony with all creation. As such there is need for change of mind-set on all of humanity with regards to nature preservation. What is important is that adapting to climate change for local communities must take into consideration what local people have and develop from there.

As has been said above, indigenous Shona religion is bio-centric and animistic meaning that all living beings are seen as members of one interdependent, spiritual community. From this perspective, it is critically important that humans live in harmony with the rest of the created world. African religions all affirm that other beings are alive and conscious just as humans and form a single ecological community. In the African religious perspectives, the world exists in a delicate balance, so humans must always act reciprocally, taking only that which is truly

needed and replacing whatever is used. Everything done is seen as part of a sacred interaction between humans and the rest of nature.

3.9 Christian attitudes to the environment: Background issues

Like other religions that originated in the Middle East, Christianity, based on the Bible as the primary text, views reality as the creation of one true God who transcends the created order (Young 1997:209). The creation is good as created by God. Humanity has been charged with the care of all creation and the responsibility for maintaining the divinely wrought harmony (ibid). One of the many convictions of faith that gives meaning for Christians is an awareness of the sacramental dimension of all creation (Santa Ana 1998:18). For Christianity, care for creation is an unavoidable thing, thus it demands collective efforts of caring for one's neighbour and caring for the social and the natural world. Christian faithfulness requires humanity to live in a right relationship with the whole created world. This means living within the natural limits of the created world, caring for it as an integral part of God's creation and tending to nature in order to increase and to use its bounty without destroying it so that it provides for successive generations (Santa Ana 1998:18).

However, it is equally important to mention that not all Christians share the same convictions on nature. Apostolic churches in Zimbabwe like the Johane Masowe interpret the natural world's existence solely to serve humans thus ruling over nature (Sibanda interviewed on 13/06/17 in Murewa). While to main-line Christians, human responsibility over nature is living in harmony with all creation.

For Christian theology, attitudes to nature have been formed through the doctrine of creation, a doctrine grounded on the belief that the world is real, surrounding us and forming the environment (Holm and Bowker 1994:29). This view is very important because the reality of the world lies at the heart of Christian theology. Much focus is first, on the relationships between humans and secondly, their responsibilities to the environment (Holm and Bowker 1994:29). The very idea of relationships provides a framework of creation in the book of Genesis. Everything is created according to its own kind and is related to all other kinds of things in an orderly way. Harmonious relationships with the natural world constitute God's perfect plan in the world. The close relationship between the environment and humans is an important fact when

we turn to the second key word in the Christian doctrine of creation that is responsibility which involves moral issues that are closely linked to the ten commandments (ibid). Christian morality is anchored in faithfulness and also requires humanity to live in harmony with the created order. People are obliged to treat the rest of creation as an integral part of God's plan to care for creation.

It is critical at this point and time to highlight some negative sentiments that have been brought forward on the role Christianity played in aiding the current environmental problems. The current debates on the causes of the different environmental problems blame Christianity as one of the major causes (White 1969:42-48). Christianity is eschatological in its view of time which began with God's creation. Christians look forward to a time of fulfilment when God will again send Jesus Christ into the world to restore the original harmony that has been corrupted by human sin. This as a result has led to the tension between humanity and the world since Christians look forward to the second coming of Jesus and thus feel alienated from the world even while they still live in it. Many contemporary environmentalists charge that monotheistic religions that developed in the Middle East like Judaism, Islam and Christianity are to a significant degree responsible for the current ecological crisis (Young 1997:287). Their reasoning is that these religions have distanced the sacred from nature and created the attitude that humans may exploit the environment at will since the prerogative has been given to humans by the Creator (ibid). It has thus led to the unchecked abuse of the environment especially in the West and to other regions as the Western influence spreads.

More so, the writings of Plato and Socrates had profound influence on the way Christians view the material elements against spiritual elements. For Plato, humans are of dual nature consisting of matter and spirit (Russel 2010:134). Socrates went further to suggest that the body is of lesser value compared to the superior value of the spirit (ibid). According to Beyers (2016), this anti-material position created an aversion for anything encountered through the senses. All material matter therefore is there to sustain the human body, there is no intrinsic value in nature and this eventually led to a utilitarian outlook on nature Beyers (2016).

At this point, it is pivotal to discuss some of the different attitudes to nature that are found in Christianity. The Christian attitudes to the environment can be classified into different categories such as anthropocentric, hierarchical, dualistic and dominating attitudes. These attitudes can allow one to look beyond them into their background hence seeing how such attitudes are nurtured by different religious teachings and thus affecting the way people view their relationship with the environment.

According to Martin-Schramm and Strivers (2003:17), Anthropocentric attitudes are those attitudes that are human centred as opposed to other members of creation animate or inanimate. These are the attitudes that place humanity at the centre of all things such that they may even assume that the happiness of humanity is the happiness of the universe. Since the emergence of human culture, these attitudes have also become part of cultural evolution. Jewish and Christian traditions have been fingered as among the providers of a foundational base upon which anthropocentricism has been built and thrived. The doctrine of creation in both traditions places humans at the apex of the creation process. The book of Genesis gives dominion to human beings (Martin-Schramm & Strivers 2003:17). By placing human beings at the centre, these religious traditions have created an unbalanced relationship between human beings on one hand and all other members of the universe on the other hand. As soon as one is given the impression that they are pivotal, it naturally implies that everything else is expendable for his or her benefit.

It can be noted and asserted that the exploitative view that has generated much of the environmental crisis, particularly in Europe and North America and subsequently in Africa, is a result of the teachings of the late Medieval Latin Christianity, which conceived humankind as superior to the rest of God's creation and everything else as created for human use and enjoyment. Therefore, one of the ways to address the ecological crisis is to reject the view that nature has no reason to exist except to serve humanity. The proposition has compelled this writer to explore the basis of this argument that religion could be blamed for the ecological crisis and try to provide possible ways through which the crisis can be rectified.

As Martin-Schramm and Strivers (2003:19) put it, Hierarchical attitudes have also contributed to the environmental crisis that continues to threaten all forms of life on

earth. A hierarchical pattern of social organisation and thought places a few males at the apex of the power pyramid characterising most societies at least since the beginning of the agricultural revolution. It is certainly characteristic of mainline Western religious traditions where God as father or monarch rules in righteous supremacy over a great chain of beings with males above females, humans above all other species, sentiment species above plants and plants above single-celled organisms (ibid). The hierarchy serves those who are socially powerful in a system of order. Today hierarchical attitudes towards nature seem to be clothed in the garb of scientific management. This perspective urges the use of resources to promote human well-being but in a way that conserves these resources for the future (Martin-Schramm & Strivers 2003:19).

Dualistic attitudes tend to divide reality into two polar opposites with one pole being superior while the other is inferior (Martin-Schramm and Strivers 2003:20). The great dualisms of Western tradition are familiar: God and the world, heaven and earth, men and women, good and evil and culture and nature among others. The dualistic frame of mind is deeply troubling especially when polar opposites are disconnected. Value judgments place one pole above the other and social custom and attitudes towards nature are formed on these judgments. The oppression of people and the degradation of nature are almost inevitable under these circumstances (Martin-Schramm & Strivers 2003:20).

Dominating attitudes towards nature have seen human beings manipulating nature ever since. Anthropocentricism, hierarchical and dualistic attitudes merge to contribute to domination, which also has a life of its own as an attitude. From anthropocentricism comes a disregard of nature, it is a backdrop, something to be used anyhow. From hierarchy comes the exploitation of the inferior by the superior while from dualism comes the separation of humans from nature. The domination and exploitation of nature follows easily from each of these attitudes and from their combined effect. Christianity has added to this dominating tendency by offering a particular interpretation to Genesis 1:26-28 and other texts that speak of dominion. Dominion has been widely interpreted as domination. Even the notion of stewardship has been interpreted as domination. The Hebrew word *radah* in the passage carries with it an idea of ruling, subduing and exercising dominion (Whelchel 2012).

Atomistic and individualistic attitudes denoted the holistic and communal ways of thinking which have characterised human societies. The new emphasis on individual salvation turned consciousness inward to the self and outward to heaven and away from the earth (Martin-Schramm and Strivers 2003:22). The problem for society and the environment stems from their holistic natures. Both require integration if they are to function well (ibid). These five attitudes towards nature are not the only ones contributing to environmental degradation. However, they appear to be the most important and demonstrate that part of the problem is the way humans think about nature. Current environmental difficulties are a result of what humans have done. Some Christians, especially the Apostolic Churches are of the view that humanity has no power to transform the natural world for the better but to enjoy what nature offers freely (Sibanda interviewed on 13/06/17).

This researcher has sought to respond to the negative assertions by developing a Christian ecological ethic that inspires environmental responsibility by encouraging adoption of those attitudes that do little harm to the environment like tree planting and conserving woodlands. There are some nature friendly attitudes and injunctions which have recently emerged to counter attitudes of dominion. Some main-line Christians have gone back to stewardship to understand it not as domination but as caring for and cooperating with nature while others appeal to Genesis 2:15 that talks about “tilling and keeping” to the Sabbatical for the land and to the ministry of Jesus as care and compassion. Austin (1998:18) summarizes positive biblical teachings on the environment as follows:

> *The Bible’s ecological perspective is remarkable for it brings nature within the community of covenant love and moral responsibility. The Lord tends a landscape which though often injured by human oppression, yearns to flourish under just treatment and beyond that, to respond compassionately to human needs.*

3.10 Activities done by Shona people in response to climate change impacts

There are many activities that are being done by the Shona people in caring for the environment. Teachings with regards to environmental care are on the increase in schools, farming communities and villages. For example, in Ward 11 in the Midlands Province, villagers have started planting fruit trees mainly to protect the soil from erosion and ensuring food security in times of drought.

The way through which the Shona people manage and make use of natural resources is very important. These resources are handled with great care because the people's livelihood directly depend on them. As a result, the care of the environment and legitimation of government policies must be directly linked to the local people. Effective and definitive steps towards climate change adaptation and mitigation requires meaningful participation of local peoples (McLean 2012). An important aspect of broadened participation has been the increased engagement of local communities in global governance. Local peoples are able to mobilize and transform themselves into a group with significant influence in setting international standards (ibid). Indigenous peoples are so effective in implementation and operational contexts because they can provide implementation tailored to specific conditions balancing on cultural and religious pillars.

-Awareness campaigns

A lot of Shona religiously driven environmental protection campaigns are being done in the area under study including veld fire-fighting, planting indigenous and fruit trees and environmental education and conservation methods. The aim of these activities are to return to the traditional methods that protected the environment. Traditional leaders play a pivotal role in educating communities on the importance of land conservation. This is usually done at the chief's courts. In all the seasons, awareness campaigns are done. Towards summer season, people gather and are informed on the dangers of stream bank cultivation, unnecessary cutting down of trees and many more. Those seeking to extend their farms seek permission from the legal custodians of the land and are instructed not to cut all the trees. In fact, they are required to leave big trees in the piece of land they will be clearing. In winter people are also taught on the dangers of veld fires which is one of the worst disturbing damage to the environment. In the picture below, ward 19 Councillor gave charge to the people to control veld fires.

Figure 3.6 Ward 19 Councillor showing people a trail of destruction by veld fires.

Photograph taken by this researcher.

-Tree planting

Tree planting is one of the many projects being done by the Shona people at local level that are meant to facilitate small scale forest management. The Shona people would introduce those indigenous tree species that are not found in their locality to cover the bare ground. Nowadays, exotic trees like gum trees and pine trees are the most planted trees because they grow fast as compared to indigenous trees.

Premium Tobacco Company in Hurungwe has also made inroads in as much as reforesting is concerned. Each household is given a sachet of Criton Keane, a huge and fast growing tree that will be used in the curing of tobacco in future. The success of this project will save the forests from further demise because at the moment tobacco production is the number one factor in the destruction of forests.

Figure 3.7 Gum trees planted in Hurungwe district in ward 19.

Photograph taken by this researcher.

Local communities are also encouraged by traditional leaders to plant trees in their plots and farms to replace those that they cut to cure tobacco. This has been a long preserved tradition of caring for mother earth and the practice has Shona religious motivation that that seek to “clothe” the bare earth.

-Land recovery programmes

Before the coming of industrial based farming implements, the Shona people had their way of growing crops. They used the method called *Makawa*, this is a method where-by people dig small holes in which seed and manure are put. Organic matter is vital in the sense that no chemical content is used. Inorganic fertilizers and weed killers have a negative impact on the soil and water systems since they pollute water bodies and thus destroy aquatic life. This method is good in preserving soil unlike tilled land which is easily washed away by erosion. The other benefit this method has is that soil organisms are not destroyed which keeps the ecosystem in balance. This method is gaining momentum in the Midlands province.

Further to that, alongside crop rotation, the Shona people also have a tradition of leaving the land to recover after three years of tilling and this is closely in line with the Jewish tradition of the Sabbath year every seventh year. This can take even three years and the land has the chance to recover well. This method is important

because the fertility of the soil is not lost through the washing away of top soil by water and wind erosion.

3.11 Conclusion

In conclusion, this chapter gave a detailed description of the study area which is inhabited by the Shona people. Geographical features were explored highlighting major changes on climate and vegetation. It was observed that the climate for the study area is dry and tropical and that it is influenced by altitude. The chapter established that rainfall and temperatures are affected by relief and altitude. More so, it was established that the vegetation cover has depreciated for the past two decades owing to high levels of deforestation and widespread cultivation.

Land degradation due to poor farming practices and use of chemicals to control weeds were cited as contributing factors to environmental damage. The effects of the ever increasing population were highlighted as some of the driving forces towards land degradation. The scramble for land has seen many hectares of forested land being cleared to cater for the huge population estimated above 16 million people. It was noted that life for the ordinary citizens has become difficult due to climate hazards. Both climatic and political factors continue to worsen the livelihoods of the people. Poverty was singled out as the hindrance to climate change adaptation since the majority of blacks are not able to employ modern technologies in producing food. Furthermore, this chapter noted that the majority of the people depend on rain-fed agriculture since they cannot afford to buy irrigation equipment. As a result, food shortages will continue to affect the people

The Shona and Christian religions were also explored. It was observed that there are some constructive beliefs systems and practices in both religions that engender environmentally friendly attitudes to the environment. Those attitudes that are negative to environmental conservation were noted. This chapter highlighted those activities by the Shona people that are meant to safeguard the environment.

Chapter 4

Research findings

4.1 Introduction

This chapter presents the research findings of this study in line with the research questions by exploring the religious fundamental roles that are important to environmental preservation. Detailed information is to be given on the importance of Indigenous Knowledge Systems and scientific forecasting methods, complementary roles between Christianity and Shona religions, the role of traditional leaders and the barriers hindering mitigation progress. Despite strong opposition emanating from the assumptions of secularism and other views, religion is proving to be a strong force to reckon with especially in developing countries where religion has a strong public face that can neither be ignored nor contained within private boundaries.

The majority of the people interviewed professed ignorance on climate change. This researcher discovered that there is lack of information especially in remote rural areas. Dependence on wood for energy and for curing tobacco has caused devastating loss of trees leaving the ground bare and in danger of erosion. It was noted that every household had an average of 7 children and the main cause of that is lack of information and interest to use contraceptives. Most people still feel that the land reform programme has not yet addressed the plight of the landless and must be continued.

4.2 The wounded earth

This study unearthed the devastating effects of human actions on planet earth. Humanity has for decades mastered an extensive art of extracting wealth from the earth aided by the advancement and sophistication of machinery used to mine, cut trees and produce goods on large scales. The world is facing the prospects of environmental disaster precisely because humanity in her passionate but blinkered pursuit of material wealth, has upset the balance of nature and endangered the very ecosystems that make human life possible (Heywood 2007:260). In number of ways, the exponential growth of the human population, the depletion of finite and irreplaceable fossil fuel resources such as coal, oil and natural gas, the eradication of forest lands that help to regulate the Earth's climate, pollution of water sources, air

and land, agricultural chemicals and the threat to biodiversity which resulted in mass extinction of animal and plant species (ibid).

Figure 4.1. Open cast mining activities destroying the environment in Ntabazinduna.

Photograph taken by this researcher.

According to the Judeo-Christian beliefs, God's creation which from the beginning comprised of many animals, aquatic creatures, trees and plants and human beings and was in a state of goodness as evidenced by Genesis 1:11, 12, 25 and 31 where the writer points out that in the sight of God, all creation was good. However, things went wrong with the fall of man, God's creation was impaired because humanity fell into sin. According to McGrath (2003:442), humanity's fall happened after their decision to turn away from God to the material world. The abuse of human free will gave rise to sin and the subsequent fall from God's grace. According to Mugambi and Mika (2001:57), humanity's rebellion spoiled the relationship between humans and nature. The fact that humanity turned away from the creator impaired the whole of creation.

4.3 Unsustainable population growth

The Agricultural and the Scientific revolutions brought with them major factors that changed human population world-wide. Production of food to feed many people became easy when man invented machines to till the land and produce more food. Scientifically, epidemics were controlled and diseases cured leading to very low mortality rates. As a result, the human population increased dramatically and with

the current rate of growth, it is estimated that the world population might shoot to around 14 billion people in the next century (Gore 2007:308). Gore further points out that what is even worse and remarkable is the fact that an estimated 94 percent of the increase will occur in developing countries where poverty and environmental degradation are already severe further affecting their ability to cope (ibid).

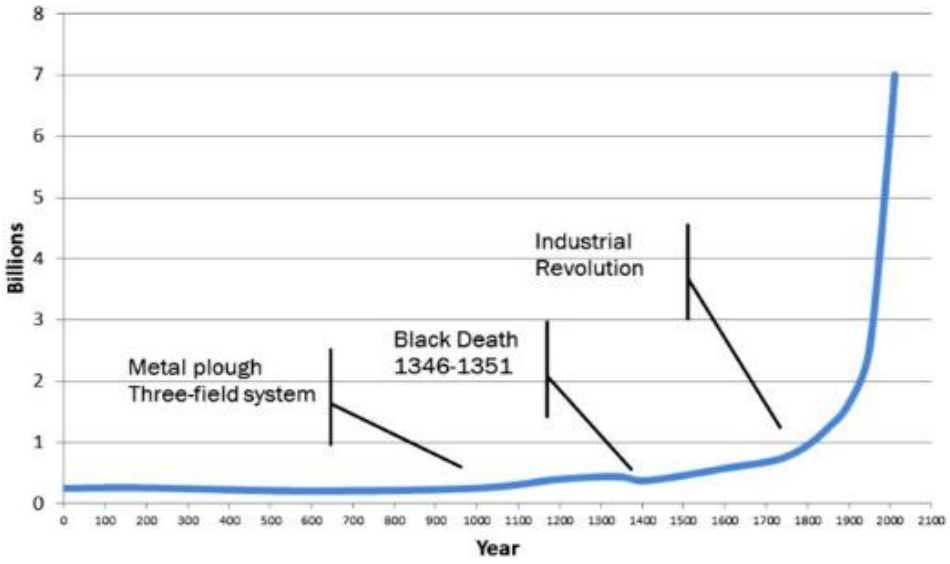


Figure 4.2 After remaining stable for many centuries, human population swelled heavily from 1800.

Source: Population Services Bureau.

The most disturbing thing with the high population is the way through which humanity live and the technological tools that are used to produce goods in large quantities. These are critical determinants on the impact of human actions on the environment. From the figure above, it can be noted that in much of human history, the human population has been stable. Human technological advancement brought with it many changes. Humanity succeeded in reducing the death rates because of great improvements in public health systems. Before the invention of drugs, vaccines and antibiotics, the majority of children died before the age of 6. However, with improved health care system, the death rate dropped significantly and this led to a sharp increase in human population (https://www.conserve-energy-future.com). Food production and distribution also improved so much that deaths related to malnutrition and hunger decreased. As technology spread to all parts of the world, people's livelihoods improved and the population began to grow.

4.4 Religious fundamental roles in environmental conservation

Religious ideas, beliefs and practices influence the moral life of people in a number of ways. Firstly, they provide those perspectives through which the world is understood and explained. People do not see the world as it is but rather as they expect it to be, in other words, they see it through a veil of ingrained beliefs, opinions and assumptions (Heywood 2007:3). Whether consciously or unconsciously, people subscribe to sets of religious beliefs and values that guide their behaviour and influence their conduct. Religious beliefs and world views thus set goals that inspire responsible moral conduct. Religious ideas also help by shaping the nature of human conduct in line with the moral demands of society and the environment (Moyo interviewed on 02/12/17 in Masvingo). Like many societies in Africa, Shona religion is founded on a set of cultural principles which are unquestionably respected by all (ibid). Religious world views act as a form of social cement providing social groups and the society at large with a set of unifying beliefs and values that they follow daily. These values reflect the life experiences, aspirations and interests of the community and therefore help to foster in the minds of people a sense of belonging and solidarity (ibid).

Further to that, religious ideas have succeeded in binding together different social groups. Shona religion for example, established sets of moral principles and beliefs based on restrictions and taboos that prohibit people from doing anything regarded as an anti-social act like killing anything that one does not eat, harming others, unnecessary cutting of trees among many things. By so doing, social order, peace and stability are realised and obedience to societal norms is enforced through aligning all values to the Supreme Being and thus conferring them with unquestionable obedience from the people.

It has been noted in chapter 1 that religion plays a pivotal role in influencing ecologically friendly attitudes to nature. Religion dominated the thinking of the Shona people to an extent that it shaped their cultural, social, political and economic organisation in line with sustainable environmental practices. Religious world views, images, beliefs and practices of nature informs the activities of, and appeals to, a greater number of people in the world which is why they are crucial driving forces of environmentally friendly behaviour. Set of myths, legends and beliefs have for a long

time helped to motivate moral human conduct towards the environment. This is the major reason why religions are crucial driving forces towards ecologically friendly attitudes. The resilience of religious practices and beliefs in this modern and scientific age is enabled by the transcendent authority whose conviction is unquestionable to humans. Further to that, bio-centric world views in Shona religion have over time enabled interdependence between humans and non-humans as a spiritual community and this has helped the African people to live in harmony with the natural world (Nyazika interviewed on 02/12/17 in Mutoko).

This African worldview understands God as the source of life on planet earth who occupies the whole physical world. It is therefore every human being's responsibility to preserve life which is represented by the living and the non-living (Mugambi and Mika 2001:58). In Shona religion, ancestors and the living dead, (those who have departed from the physical world of the living), are understood as God's instruments through which instruction reaches the community (Mugambi and Mika 2001:58). In all stories, legends, myths told from one generation to the other, God is presented as the one who has not only given moral instructions to the ancestors but has lived in communities among them. In these stories, God is present in the lives of humans providing them with daily needs like food, rain shelter among many more (ibid). That is the reason why when the Shona people plan for the future, they often say *kana Mwari vachida*, that is, when God is willing, all will be well (Dembedza interviewed on 02/12/17 in Mutoko).

In Shona religious world view, one remains content and healthy in a holistic sense only by living in harmony with the rest of creation. Abundant life is realised only when effective healing involves reconciliation with the entire cosmos including the living and the dead in such a way that nothing can exist without this interdependence (Mugambi and Mika 2001:58).

Shona religion has proved to have a rich traditional heritage that is ecologically friendly. Attitudes to nature in this religion seek to promote sustainability and harmony that consider the existence of nature as part and parcel of the created world. In African cosmology, the land is not only an economic resource but a home and a place for sacrifice to the creator God (ibid). In light of this, land degradation

has been and continues to be avoided at all costs. The concept of *Unhu/Ubuntu*, whose thrust is on doing that which is good to others who in turn reciprocate, has enabled the conservation of wild life species. Humanity is encouraged to take that which they need for daily use and to spare that which they do not need for future use. Animism and Totemism have helped to keep the wild life population at sustainable levels in Shona societies in the past decades until the rise of rampant poaching for ivory because for the Korekore-Nyombwe people, the knowledge of their environment helps them to direct the course of their lives as they try to live in harmony with nature (Mangena 2012:67). As such, people would not kill those animals they do not eat and those animals with which they share the same totem (Mugari interviewed on 02/12/17).

As has been noted above, everyone in Shona religion has a moral and religious obligation towards the upkeep of the environment. Shona religion is not concerned with metaphysics but this present world. Shona people want to live happily in this world. This explains why they will marry many wives, bear male children, rear many cows and enjoy life here and now. Religious experiences are part of the experienced world. Every aspect of human life has something to do with religion and this is a vital component of earth-care. Note-worthy is the fact that religious solidarity with the poor runs across all religious traditions of the world and thus cover greater numbers of people. In light of this, people are encouraged to focus their attention on social issues and the environment around them. Ecological justice cannot be realised in the twenty-first century without sound environmental protection measures. Since religions are embodiments of moral claims into cosmologies, symbolic and ritual communities, they have the abilities to transform human behaviour for the better leading to sustainable use of the natural resources.

Not only Christian and Shona religions are environmentally conscious. According to Heywood (2007:263), fundamental sources of new concepts and theories are found in religions. In the Tao of Physics (1975), Capra drew attention to important parallels between the ideas of modern physics and those of eastern mysticism (Heywood 2007:263). Eastern religions like Hinduism, Taoism and Buddhism have long preached the unity and oneness of all things, a discovery that western science only made in the twentieth century (Heywood 2007: 263). Many advocates of

environmental care have been attracted by Eastern mysticism seeing in it both a philosophy that gives expression to ecological wisdom and a way of life that encourages compassion for fellow human beings, other species and the natural world. Ecological principles are also embodied in monotheistic religions like Christianity, Judaism and Islam which regard both humankind and nature as products of divine creation. In such circumstances therefore, human beings are viewed as God's stewards on Earth and are invested with a duty to cherish and preserve the environment (ibid).

Most influential concepts for modern environmental protection have been developed by looking back to primal religions which often drew no distinction between humans and other forms of life and little distinction between the living and the non-living objects (ibid). In primitive religious worldviews, all things are alive, stones, rivers, mountains and the Earth itself are viewed as Mother Earth. The idea of an Earth Mother has been particularly important for ecologists trying to articulate a new relationship between human beings and the natural world (ibid).

Other religions of the world have very important environmentally friendly attitudes that are important to mention in this study to reinforce the claim that religions are vital tools through which a positive understanding of environmental care is obtained. These religions offer different and sometimes similar sets of moral values, rules and laws that guide human beings on how they must relate to their natural environment. These religious practices and beliefs are an indication that religion is a vital force that can yield definitive solutions, and help communities to act responsibly towards the environment.

In most Japanese religions like for example Shintoism, nature is accepted as part of the given-ness of the world as opposed to a self-conscious concern with ecology and the environment (www.environment-ecology.com/510-shintoism). Since the Japanese people acknowledge the presence of the divine within nature, they hold that the ideals of life must be in harmony and united with nature (ibid). Thus for the Japanese community, conservation of the environment is inculcated into the lives of community members as an obligation since their lives are interdependent with that of the environment. This interdependence between humanity and the rest of creation

has for decades enabled the Japanese people to live in harmony with the natural world.

In China, the Confucian ethic stresses so much on social harmony and the well-being of the community within its natural world. There is high optimism about the world and humanity taking good care of each other with no idea that the world will come to an end (Davies 1994:4). These religious traditions that do not propagate another world in future other than the present world tend to engender an optimistic and positive attitude towards the preservation of the present world they know which they call home. In other words, the focal point is that humanity must be in harmony with this world instead of propagating attitudes that look down upon this world as a threat to humanity. Reciprocally, humanity also must not be a threat to the environment.

The Confucian religion of China also share almost similar views that call for harmony between people and their environment as expressed in the paired ideas of Yin and Yang (ibid). This pair helps to compose a system of classification embracing positive things. The idea of Tao expresses the universal principle of order and is closely related to the virtue, power with which “Tao” endows everyone (Davies 1994:4). As a result, humanity and nature are seen as being a part of the same scheme of things hence their interdependence. The idea of interdependence between all created beings requires collaboration and greater cooperation by all members in preserving the environment. This in turn communicates the fact that the death of one signifies the death of all and the life of one signifies life for all beings. Preserving the environment therefore is seen as a way of preserving the human species and other living things on planet earth and it is deemed a necessity for all humans to embrace.

In the case of Sikh religion, people have a world view in which nature is understood as expressing the creativity of God which must be taken care of at all times (Davies 1994:6). All the created “beings” are respected in Sikh religion. This world view is capable of prompting humankind into an awareness of the divine commands that provide ethical conduct which is a potential ingredient for sensuous living in the world (ibid).

In Hinduism, the concept of environmental protection is not a modern phenomenon but it is as old as the religion itself. Several ethical values that were crystallized during the classical period of Hinduism are a true reflection of ecological sensitivity (Young 1997:284). According to Hindu teaching, even that which appears physical is in truth the manifestation of the spiritual. This perspective is purely eco-centric, for at the centre of life itself, is imaged as an interconnected and spiritual whole (ibid). This was inherited from the ancestors who held the belief that humans, gods and nature are integral part of the one organic whole.

The Hindu preference on vegetarianism, veneration of cows and the general teaching of non-injury referred to as ahimsa, flow from this understanding of spirituality. Anthropocentricism and its attendant attitude of the human right to exploit nature is not part of the basic Hindu world view (bid). Another ecologically oriented Hindu value is restraint. It is an aspect of the Hindu ideals of the renunciation of attachment to one's actions in order to break free from the effects of the law of Karma as expressed vividly in the Hindu sacred book the, Bhagavad Gita (ibid).

In Theravada Buddhism, the stories of the life of the Buddha as preserved in Theravada tradition indicate that the religion's founder himself was in harmony with nature (Young 1997:83). The Buddha was born under a tree and he experienced enlightenment in the forest on the banks of a river. Crawling creatures moved on his head to protect him from the sun (ibid). Therefore, in his teachings, the Buddha implied that animals' lives were equally important as that of humans. One of the principal values that were taught by the Buddha was *metta*, that is the loving kindness for all beings (ibid). In Buddhism, compassion must be displayed to all living beings and the underlying reality is on environmental care. In view of this, it can be noted that the different religious traditions have different attitudes towards the environment with some religions positively valuing the environment while others engendering negative attitudes towards the natural world.

4.5 Indigenous Knowledge Systems (IKS) and Weather Indicators

IKS is a body of knowledge for a particular group of indigenous peoples within a specific geographical setting that has survived for long periods of time (Mapara 2009:193). It is knowledge with inherent connection to one's surroundings and its

development was purely observational and provides base for future generations to understand weather variables (Materer, Valdinia, and Gilles 2001). Local weather and climate are predicted, assessed and interpreted through locally observed variables and human experiences on different plants, animal behaviour, wind, astral movements and meteorological information. It has major benefits for low costs by providing information that all people can access and understand, providing ease of communication enabling people to work together (ibid).

The Shona people have a rich base of traditional knowledge systems that have helped them to sustain their lives for many years. However, these knowledge systems have not been fully tapped to help communities ensure food security especially in times of drought. These knowledge systems have been developed on lived experiences these people have been facing in agriculture and environmental preservation. Unfortunately, with the coming of scientific discoveries and industrialisation, local communities were overwhelmed by its sophistication and abandoned their treasured heritage which governed agricultural planting time and moral conduct of society. The other factor which facilitated the abandonment of the IKS's and the growing of traditional crops was brought by industrialisation which saw the emergency of market economies. Farm produce was sold and people accumulated a lot of wealth without due care to the environment. As a result, many traditional crops like millet, rapoko were abandoned in favour of cash crops like tobacco, wheat, cotton since monetary reasons prevailed over subsistence needs.

The graph below emanated from the Focus Group Discussions conducted on the third of December 2017 at Gokwe centre in the Midlands province and Mhangura in Mashonaland west province. It shows in percentages, that the majority of people have resorted to growing more cash crops as compared to food crops. The government has been under pressure for the past years providing food aid in the entire country which drained the fiscus of capital that could have been used to finance other sustainable development programmes.

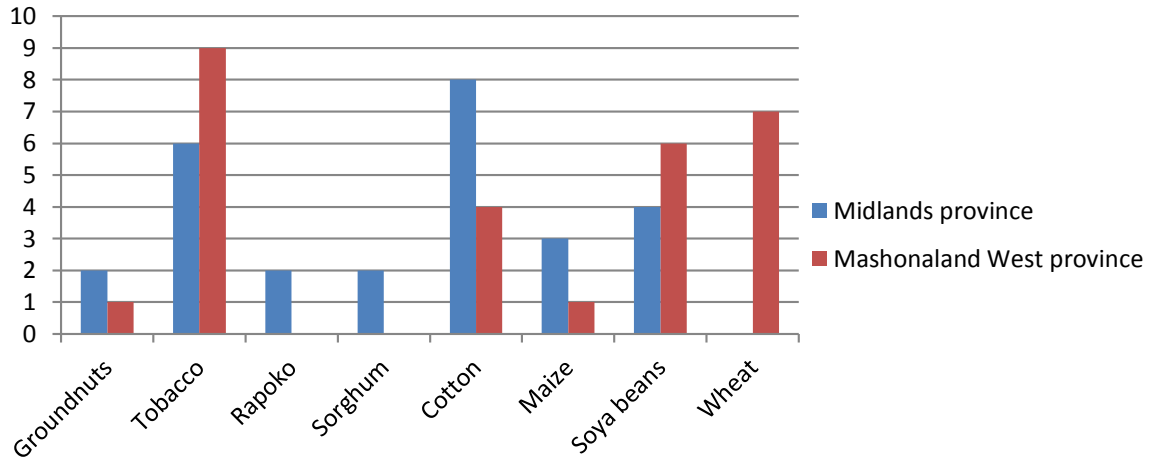


Figure 4.3 Cash crops getting more preference than food crops.

Graph constructed by this researcher.

The challenge forcing people to resort to cash crops include lack of formal employment in the country and the information gap especially in the young peole on traditional crops. Traditional foods have lost popularity among youths to the extent that many would grow maize in small quantities but grow commercial crops.

The graph below provides evidence on the way younger generations view Indigenous Knowledge Systems in favour of Scientific Knowledge Systems. The older generation favours of Indigenous Knowledge Systems a phenomenon which they have life experiences on.

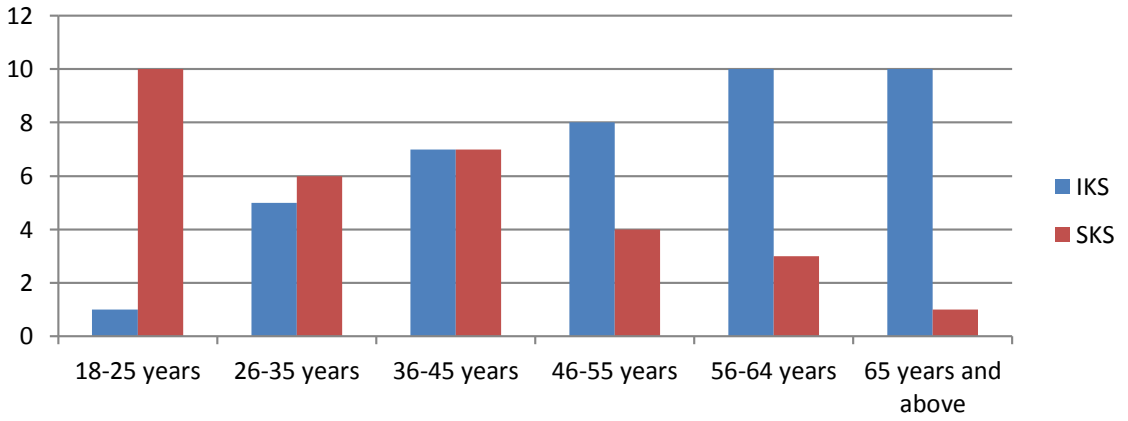


Figure 4.4 Perceptions of the young and old generations between scientific and traditional knowledge systems.

Graph constructed by this researcher.

Despite the abandonment of traditional beliefs, practices and IKS's, Shona religion stood the test of time and continued to influence the local people's lives in many ways and people continue to uphold them. The same thing should be happening in the case of Indigenous Knowledge Systems whereby, instead of side-lining them, they must be incorporated and work alongside modern scientific knowledge systems on complimentary basis. This study discovered that Indigenous Knowledge Systems are an important aspect in the fight against the effects of climate change because of their ability to create a moral and sustainable economy. These systems identify with people within a cultural context thereby promoting decision making processes that are based on observable phenomena.

Indigenous religions of Africa's resilience in a world that has been dominated by scientific developments is a clear indication that they are a vital component in shaping human behaviour towards the environment. From the interviews that were conducted, about eighty percent of the interviewees agreed that plants offered substantial information with regards to approaching cropping seasons. The time when the new leaves appear in vegetation is a vital indication whether the rains will come early or late. When leaves appear early, late maturing crop varieties can be planted. If the new leaves appear late, it means that early maturing crop varieties must be planted since rains will be below the expected amount and are likely to come late. This has been corroborated by Alvera (2013:27) writing on Indigenous Knowledge Systems in Muzarabani in Zimbabwe that plant indicators offer valuable information to farmers. At the end of the 2016/2017 farming season, the Meteorological Services Department of Zimbabwe indicated that the 2017/2018 farming season will receive early and enough rains just as the previous season and many farmers planted their crops early. As a result of this information, many farmers resorted to early planting of which many did not stagger their crops, that is planting part of the crop early and then plant another batch late in order that if the first crop fails, the second batch matures. As a result, much of the first crops were hit by the dry spell and the problem is further compounded by the fact that the majority of the people are not able to irrigate their crops.

African peoples grew crops like Sorghum which provided much needed nutrients and calories to many impoverished communities. This crop is durable and resistant to

heat thus making it a valuable crop in times of drought. High yields were realised without irrigating the crop. As such small grains like Sorghum have been staple foods for poor rural peoples for hundreds of years.

Figure 4.5 Sorghum crop grown in drought prone Midlands province.

Photograph taken by this researcher.

As has been indicated in chapter three, the Midlands province receives little rainfall ranging from 500-800mm annually with dry spells in mid-season. When early maize crops failed, sorghum got to maturity and the yield was high. However, many communal farmers in the Midlands province have resorted to cash crops but those few farmers who grow this crop are not affected by recurrent droughts (Tembo interview 03/12/17 in Kwekwe).

The figures below show a Case Study by this researcher in the Midlands province that were meant to try and establish the reliability of the IKS's in line with the scientific weather forecasting systems during the 2017/18 cropping season. The Meteorological Services Department had forecasted that the coming season will receive enough rainfall starting in November just like what had happened the previous farming season. On the other side, the fruits that the indigenous trees bore were interpreted as pointing to late rains as held by interviewed elders.

In figure 4.6 below, the wilting maize crop that was planted early in November based on the Meteorological Service Department information that there shall be more rainfall is a total write off. In figure 4.7 the promising maize crop was planted late in January basing on the IKS indicators which forecasted late rainfall.

Below are the results of the case study.

Figure 4.6 Late maturing maize crops planted in November 2017 hit by dry spell and late rains.

Photograph taken by this researcher.

Figure 4.7 Early maturing maize crops planted late in January 2018.

Photograph taken by this researcher.

In figure 4.6, the crop was planted after the first rains fell. The dry spell continued and at tasselling stage, the crop succumbed to the heat of the African sun and all the crops that were planted at the same time are total write-off. In figure 4.7, the crop is showing high likelihood of success since it was not being affected by the December/January dry spell. It is important for the Meteorological Services Department of Zimbabwe to take into consideration the value of their forecast information because low value forecasts are cheap but in most cases lack accuracy.

Contrary to what the Meteorological Services Department had forecasted, the Indigenous Weather Indicators pointed to a different scenario. Towards the beginning of the 2017/2018 farming season, many fruit trees bore more fruits and according to the interviewed elders, this was an indication that rains are coming late and that little rain will fall especially in February. Interviews conducted in the Midlands province echoed the same sentiments with those that were conducted in Mashonaland West province and advised that people should focus on planting late and target early maturing crop varieties and other drought resistant crops like sorghum, millet and rapoko. However, the majority of the people relied on the scientific information and indications are that there shall be more rainfall in the 2017/2018 farming season which was not the case. As a result of lack of complementarity approaches between science and religion, many farmers are losing their crops to the heat wave being experienced across the region.

The figure below shows a fruiting *Mugang`acha* tree which is believed to point to late rains and the possibility of drought, a fact that was corroborated by all interviewed elders during FGD on 4 December 2017.

Figure 4.8 Mugang`acha tree with more fruit an indication of late rains.

Photograph taken by this researcher.

Other trees like the *dysprosmespiliformis mushumha, parinari curatellifolia muhacha*, are also good weather indicators. The more fruit they bear, the likelihood of late rains and drought. If they bear little fruits, it is believed that there will be enough rains. Indigenous peoples intimated that the abundance of fruits from these fruit trees is understood as nature's way of ensuring that humanity and animals survive in times of scarcity. This is held as a valid claim by most indigenous peoples because the majority of elders interviewed confirmed that quoting cases of 1947, 1982, 1992, 2002 droughts where people survived by eating wild fruits together with food aid they received from the government and non-governmental organisations.

Further to that, the Zimbabwean First Lady Honourable Auxillia Munangagwa on the 18th of December 2017 launched Kusasa project by planting a Mulberry tree in the Wetlands west of the capital Harare. She indicated that she will oversee the planting of fruit trees in order to ensure people have something to eat in times of drought. It is believed that fruit trees provide food during times of crisis and are to be preserved.

Acacia trees are also believed to be effective natural weather indicators especially in the western parts of the Midlands province where the trees are in abundance. These

trees produce white and yellow flowers. If they produce plenty of flowers, it is an indication that more rains will fall.

The diagram below shows four different trees and interpretations made from the flowers they produce and the fruits they bear.

Type of tree	Appearance/Indicator	Results
Accacia	-Trees produce more flowers. -Trees produce little flowers.	-There will be more rains. -There will be drought.
Mugang`acha	-Trees produce more fruits. -Trees produce little fruits.	-Rains will come late. -Rains will come early.
Mushumha/dyspros mespiliformis	-Trees produce more fruits. -Trees produce little fruits.	-There will be drought. -There will be good harvests.
Muhacha/Parinari curatellifolia	-Trees produce more fruits. -Trees produce little fruits.	-There will be drought. -There will be good harvests.

Table 4.9 Interpretations on possible outcomes from tree appearances and fruiting from FGDs held on 04/12/18.

Graph constructed by this researcher.

4.6 The role of Traditional leaders

Traditional leaders played an important role in environmental conservation in Africa. But with the reorganisation of political institutions where some nations favoured democracy as preferred form of political organisation, there has been the weakening of the local levels centralising all power in the national government. The modern characteristic of the nation-state disrupted local authorities and gave way to massive environmental degradation in many communities where local leaders feared political backlash from government leaders.

However, traditional leaders have been and continue to be the pillars of environmental conservation in Zimbabwe as enshrined in the new Zimbabwe Constitution adopted in 2013 (Village head Zinyemba interviewed on 06/12/17 in Chinhoyi). It has been observed in this study that since the pre-colonial times, traditional leaders played a pivotal role in moulding a socially and morally just society in Africa as a whole and Zimbabwe in particular. Cases were brought to the attention of the village heads, headmen or even to the chiefs for execution of justice and it was done in accordance to the dictates of the cultural values and norms (Mutimutema interviewed on 06/12/17 in Chinhoyi). These traditional leaders were and are still referred to as custodians of land. It is their duty to make sure that all the land under their jurisdiction is well conserved (Traditional leaders Act Chapter 29:17 of the Constitution of Zimbabwe). The village heads have the responsibility to protect and make sure that the safety of the village woodlots is not disturbed. Their duty also includes taking action against those who exploit the forests and woodlots. As a result, local leaders play an important role in environmental protection.

Traditional leaders are with no doubt the custodians of indigenous knowledge systems which play a pivotal role in the way natural resources are being managed especially nowadays when consumption patterns have had devastating effects on the natural environment. From the time Zimbabwe got independence from Britain in 1980, the traditional leaders derived their power and authority from the Traditional Leaders Act Chapter 29:17 of the Constitution of Zimbabwe. However, the roles of the traditional leaders seem to be waning especially form the time traditional leaders were used by the government to help in mobilizing people to vote for them. Their focus shifted as some traditional leaders became partisan and their sole responsibility lost relevance.

In the year 2000, the Zimbabwe government embarked on the Fast Track Land Reform programme correcting the colonial imbalances where the majority of the population were landless. Some traditional leaders got involved in allocating land for agriculture even in protected places like wetlands. This marked a terrible situation where deforestation rose and soil erosion silted many water bodies. Animals were killed by new farmers without control affecting the balance of the ecosystem.

Land redistribution programme in Zimbabwe was not the problem since it sought to accord every Zimbabwean a chance to own land on which they will grow crops to sustain their lives. The problems that emanated from the exercise ranged from loss of life, property and that that some traditional leaders usurped political power and abused those powers to the extent that they undermined their cultural and traditional roles using their political power for their selfish benefits. A chaotic situation came whereby many of the landless Zimbabweans would go to powerful political leaders and bypassing the government instituted Lands Committees and allocate themselves land in areas that were not earmarked for land redistribution by the government (Joe "pseudo name", Interviewed on 06/12/17 in Harare). These areas include wetlands, swamps and sacred forests. As a result of this confusion, wetlands, sacred grooves were destroyed, animal habitats plundered and river systems got polluted more.

Nevertheless, there exists quite a number of religion based traditions of successful nature conservation methods from the hunter-gatherer times which were retained and passed to other generations (Village head Zinyemba interviewed on 06/12/17 in Chinhoyi). These include the protection of sacred grooves, swamps, sacred forests, sacred organisms which provided food, water, raw-materials and sanctuary for both humans and animals. These sacred places are patches of land which were dedicated to some deity and are kept free of all forms of exploitation and the practice is still maintained to this day. Sacred places form islands of vegetation and many varieties of plant species that are considered sacred are therefore never to be destroyed. The preservation of these places is helping in maintaining the balance of animal species and vegetation. Much of the non-cultivated tracks of land are firmly committed to a role supportive of agriculture and are maintained well by villagers as asserts under community control and are preserved as grazing areas for livestock.

In a move that was aimed at monitoring human activities on the environment, the Zimbabwean government established the Environmental Management Agency (EMA) that is a government arm whose mandate is to ensure that environmental legislation is fully adhered to by all citizens at all times. For EMA to achieve its task, it relies on the assistance given by other stakeholders especially the traditional leaders. For the promotion of sustainable development and natural resources management systems, traditional leaders are a pillar upon which this noble idea is to

be achieved. In every district in Zimbabwe there are Environmental Management Agency officers who are expected to work closely with Traditional leaders updating them on the latest environmental legislation enacted and to train people on positive environmentally practices. This move has seen reduction in veld fires, unnecessary cutting of trees and stream bank cultivation activities because of its inclusiveness (https://www.ema.co.zw).

Traditional leaders set penalties for law breakers and carry out awareness campaigns to teach the locals on how to conserve the environment. They also identify and establish woodlots and grazing schemes in their areas of jurisdiction and adjudicate in all land disputes in their areas through the *Dare/inkundla* that is the traditional king's court and make laws in line with cultural norms and values. One major advantage of these traditional leaders is that their tasks are not very expensive to maintain and thus contribute immensely to environmental conservation at no cost. Further to that, they are in constant contact with the people which makes them effective in dealing with communal issues.

4.7 Diverging world views and perspectives between Christianity and Shona religions

Despite the commonness of religious contributions to environmental protection, there exist clashes between Christian and Shona world views that inform these two religions' attitudes to nature (Taringa 2014:82). These clashes border on belief systems and spirituality. Shona religious spirituality holds that all created things have a soul and that certain places and objects are sacred which is in direct contrast with the Christian belief that only humanity has souls and that divinity is for God alone and not creatures (ibid). This explains why missionaries demonised these sacred places signalling the collapse of African cultural heritage hence the enmity between these two religions.

In Shona religion there is belief in a tripartite worldview that emphasises on three important realms. They include the human world, the underworld and the spiritual world. The human world consists of the living and non-living beings whose place of habitation is the land. The Shona cosmology is strengthened by the belief that behind all creation, there is an impersonal, omnipotent and principal creator called

Musikavanhu the creator God, *Nyadenga*, the owner of the Heaven and Earth whose authority over creation is unquestionable (Spirit Medium, Nehoreka interviewed on 06/12/17 in Kariba). Rivers, mountains, rocks, valleys, forests, swamps and grooves are all believed to have spiritual endowment. This has for decades resulted in great care being taken in preserving the natural world. About 70 percent of the elders interviewed during the research bemoaned the erosion of cultural traditions as the main cause of environmental problems. In Shona religion, nature is understood to be sacred because it derives its being from the creator God who cares for the world (ibid).

Secondly is the underworld, the abode of the dead. It is equally another important realm in Shona religion and cosmology. It is a place where the deceased people rest. Traditional leaders especially chiefs are buried in caves and high mountains. These places are revered as sacred to the extent that no tree from such areas should be cut. Further to that, constant communication with departed relatives is maintained and libations are poured on the ground to maintain this long preserved tradition. Breaking the rules attracts fines in the form of cows.

Thirdly is the spiritual world which is also an important realm in Shona religion. It is the abode of *Mwari* the creator God whom on the spiritual hierarchy is at the top followed by the ancestors. It is believed that anti-social acts like incest, killing, witchcraft among other wrongs on the part of humans irks the anger of God and the ancestors whose anger results in infirmities and calamities such as droughts, sicknesses and even mysterious death of humans and animals. With such religious background, indigenous religions were able to take good care of the environment in response to the demands of the Supreme Being and also out of fear of reprimands by the ancestors. It has also been observed in this study that Shona religion is geared towards maintaining harmony and help people to be in close communion with nature. Every adherent of this religion owes all the goodness and decency to the community and ancestors. Prosperity, comfort and good living are derived from the ancestors therefore humanity must on no account deviate from the path of normality lest they lose the protection and beneficial influence of the ancestors (Gelfand 1972:30).

The moral consequences of earth-keeping in Shona religion are not just for short-range survival of the human groups but its overall goal is to help people to fear the ecological problems such as deforestation, overpopulation, pollution among others. Such an attitude has helped humanity in maintaining the ecological balance. It is from these practices that Shona religion is responsible towards the well-being of the environment (Taringa 2014:83). Religious convictions inform the Shona attitudes to nature that is the reason why traditional religions were able to conserve the environment for decades.

On the other hand, Christian world views and perspectives are firmly anchored on strict monotheism which emphasises that there is only one true God the creator of all that exist. Polytheism and the plurality of gods are rejected norms in the Christian religion. The conflict between Shona religion and Christianity is that the later views Shona religion as a religion that believes in many gods. For Christians, there is no other divine power that controls the universe except God and the doctrine of creation shapes and informs the Christian attitudes to nature (Holm and Bowker1994:29). According to Taringa (2014:11), a conference was organised by the United Nations representatives in Zimbabwe on dialogue between civilizations and religions in 2001. Some Christian representatives walked away because they felt they could not share the same platform with representatives from the African Traditional Religions particularly traditional leaders some of whom came wearing their traditional robes. From this and subsequent meetings, it became evidently clear that traditional religions and Christianity will always be on a collision course especially when dialogue revolves around particular religious` beliefs thereby negatively affecting the complimentary progress to help societies cope with the effects of climate change.

It was noted in this research that Christianity also clashes with Shona religion on animism, the belief that every created thing has a soul (Taringa 2014:50). This belief equates all creatures to be at the same level and being of equal importance which is different from the Christian belief that humanity is above all created things. As a result of the long standing divergent beliefs, it has become difficult for the two religions to co-exist in harmony with each other. In Christianity, humanity as contrary to Shona religion, is at the apex of the creation order and is endowed with authority over all creation (Genesis 1:26-29; 9:1-3). With the fall of man, God's plan and

intention was disturbed and harmony between humanity, nature and God waned. Nevertheless, Jesus Christ brought new hope whereby the relationship with God was restored. God's purpose to heal and reconnect with fallen humankind was finally consummated in Christ, (Colossians 1:19-20) and humanity is encouraged to take the role of stewards to safeguard creation in a sustainable manner.

Despite the differences between these two religions, threats posed by global warming and subsequent climate change require inclusivity, tolerance and collective efforts to overcome. It was discovered in this study that Shona attitudes to nature provide a model of restraint with the knowledge that not all we can do we should do. The religion provides restrictions that are helpful in a coordinated effort to help communities deal with climate issues. An attitude that is based on a clear sense of restriction is important in environmental preservation. Similarly, Christianity has the rich teachings on stewardship which in religious tolerance and mutual unity can help Shona religion whereby attitudes are helped to move beyond attitudes to nature being a matter of human survival to a matter of steward for resources. It is clear that time has come for these religions to focus on sustainable areas of complementarities.

4.8 Scientific Weather Indicators

Traditional religions have effective ways of understanding weather that are different from the scientific models of weather forecasting. However, there are notable limitations that must be complimented by scientific weather forecasting tools. In developed nations, weather forecasting is made easy because of the availability of modern equipment with high accuracy rates. This has enabled developed nations to be able to prepare and minimise dangers caused by extreme weather conditions.

Operating independently of the other and without the complimentary assistance, both Scientific and Indigenous Knowledge Systems alone are less effective. For example, the cyclone El-Nino phenomenon which has for the past decades caused severe droughts in the southern parts of Africa is not understood. This stands as a major drawback in food security measures in developing countries especially in poor communities that rely on rain-fed agriculture. Due to the effects of the cyclone El-Nino, much of the low lying Zambezi valley is prone to floods and droughts and the

locals have no idea of what to do except to wait for help from the government and non-governmental organisations. Drastic weather events continue to occur affecting the livelihoods of rural communities catching them unaware because they do not have access to forecast information. Rural farmers are ill equipped to face the challenges caused by cyclones and these have caused diminished crop returns, high mortality in both humans and livestock due to diseases outbreaks and epidemics (Agricultural Extension Office in Karoi).

Of greater importance is the use of modernised and highly effective weather forecasting infrastructure and resources in developing countries. This helps in providing accurate weather forecasts and predictions. Scarce information that is dished out to rural communities is met with many challenges. The inability of the majority of people to interpret forecast information generates data that is not relevant to the people. As a result, such forecasting will not be addressing attendant issues that need attention.

According to Matera et-al (2001), the other problem associated with the scientific weather forecasting is the collection of accurate data. Climates, especially in mountain regions are variable over time. Microclimates in mountain areas always affect the accuracy of data collection and make it difficult to forecast over the area. Data collection is made even more difficult in developing countries due to lack of adequate infrastructure and modern resources because when data is collected, climate models require a lot of improvement to be considered reliable for people to base their planning on (Matera et al 2001).

4.9 Notable barriers to effective climate change mitigation and adaptation

Despite much ambitions and global attempts to curb the effects of global warming and helping communities adapt to the prevailing climate conditions, there are many barriers hindering positive mitigation, adaptation and sustainable development and deployment of renewable technologies. In light of the imminent dangers of climate change, humankind has no choice but to reverse the policies and practices that have brought both the human species and the natural world close to demise. Nevertheless, a number of problems confront ecological theory. In the first place, it is difficult to see how ecologism can become a genuinely global ideology universally

acceptable to all countries with different political and economic persuasions. As far as developing countries are concerned, its structures appear to deny them the opportunities to catch up with the developed western countries (Heywood 2007:278).

Western countries developed through large scale industrialization, the exploitation of finite resources and a willingness to pollute the natural world, practices they now seek to deny to the developing world. For example, economic development in China resulted in the commissioning, on average, of one new coal fuelled power station every week during 2006, resulting in eight of the ten most polluted cities being in China (ibid). However, the industrialised West is no more likely than the developing world to fully adopt ecological priorities, as this would mean that it, as the major consumer of energy and resources would have to forgo the prosperity it already enjoys. This is evident in the reluctance of states like America and Australia to ratify the Kyoto Protocol (ibid). Industrialism and its underpinning values such as competitive individualism and consumerism have become deeply entrenched as a result of economic globalisation. Globalisation in this case is seen as a form of hyper-industrialism that is being opposed by the anti-growth message of ecologism.

Further to that, climate change mitigation is being held back due to the fact that it is deemed a less national security priority compared to terrorism, nuclear weapons, territorial integrity issues that are given priority and funding. On the 11th of December 1997, the UNFCCC initiated an international discussion on solutions to the climate change problem in Kyoto, Japan but failed to produce definitive solutions because of reluctance by super powers to commit themselves to the demands of the protocol to reduce Greenhouse gases from further accumulating in the atmosphere. The Montreal protocol meeting held on the 16 of September 1987 and the Copenhagen climate conference in November 2009 failed to convince the world to act on carbon emissions reductions despite many nations ratifying those protocols.

Of major concern is the fact that the world is failing to recognise the unshakable political, economic and cultural differences that exist between different nations and self-interests of these nations. In Africa, development is one major issue that is being blindly pushed forward without taking stock of the harm that is being done to the environment. Governments are mainly focussed on winning elections and retain

power. People need jobs and to suddenly cut the use of fossil fuels will mean thousands will lose their jobs which will have negative impacts on governments such as civil unrests and demonstrations. What some political leaders want is to avoid things that will turn the people against them at the expense of long term benefits of earth care (Zindoga “pseudo name”, Interviewed on 08/12/17 in Gweru).

Economically, Africa is lagging behind despite having a wealth of natural resources. As a result, many are forced to continue to use those natural resources available cost free despite the dangers of carbon emission. Further to that, unfair distribution of resources is affecting the transfer from fossil fuels to renewable energy paths (Zindoga “pseudo name”, Interviewed on 08/12/17). Those capital resources that can be used to earn foreign currency and help in technological capacitation are grabbed by the few elites thereby halting the coping capacities of poor communities. Corruption is rife in most Africa countries such that developed nations are not willing to assist financially (Transparency International 2016). In light of this, poverty stricken countries will always be on the negative side of climate mitigation and suffering the most.

In the developed world, much effort is spent on security developments. With the ever rising threat of terrorism and the need for nations to protect themselves, weapons of mass destruction are being developed. Currently is the enmity between the United States of America and North Korea who are always threatening to attack each other (New York Post 23/09/17). Attention is then focussed on defence against possible attacks by developing sophisticated nuclear weapons whose handling and disposal are very expensive. These nuclear weapons have devastating effects on planet earth when there is a nuclear accident like the Fukushima nuclear accident which happened on 11 March 2011 in Japan and when they explode. These effects include the heat waves where extremely very hot gases under high pressure are emitted causing overpressure capable of destroying anything within two to seven kilometres from ground zero and thermal radiation that is produced consisting of ultraviolet and infrared radiation having catastrophic effects on the environment (Jacobs 2003:25).

-Information and technology gaps

The capacity for mitigating climate change and helping communities adapt to its impacts is limited by the unavailability and lack of economic viability of appropriate information technologies and robust methods of disseminating information to all people. Noteworthy is the problem of limited understanding of political, economic and institutional frameworks to mainstream adaptation into development programmes to reduce vulnerability to weather changes (UNFCCC 2006-2007 report). Information is a vital tool in modern developmental programmes and lack of it spells doom to sustainable development. Access to information is a major challenge in Africa and most developing countries in the world. Poor and remote communities are the worst affected since access to information is beyond the reach of many. This sometimes caused by government control on information publicity where propaganda is used as a tool to influence and deceive people. In Zimbabwe some legislation hinders the participation of private players in the dissemination of information. The Access to Information and Protection of Privacy Act (AIPPA) of 2002 gave all control of the media to the government whereby other sectors are suppressed from giving out information.

Poor communities in sub-Saharan Africa are more vulnerable to climate disasters affecting the whole world today. The ability of poor nations to adapt and cope with these extreme weather changes has been heavily affected by high levels of poverty, financial crises, poor economic resources, poor infrastructural development, and limited access to modern technologies. Most developing nations do not have adequate resources in order for them to be prepared for impending dangers and climate hazards. Due to immense financial crises, it is difficult for poor communities to detect early warnings of possible dangers and disaster response systems together with recovery abilities are far beyond reach.

Developing countries lack the required information and modern technological tools needed to enable definitive coping capabilities. This has proved to be the heaviest blow to climate change mitigation and adaptation. The majority of the people especially in rural areas do not have adequate climate change information. Access to the internet and news broadcasts coupled with the cash crisis has made it very

difficult for the rural folk to access valuable information (Muchemwa interviewed on 09/12 17 in Zhombe). While some people are aware that the climate is changing, the problem of poverty has had adverse effects on them as most households are hit by malnutrition. In April 2017 in Mashonaland West province, Hurungwe district for example, locals petitioned the Member of Parliament for the area to assist in de-silting the dams and the honourable member lamented the cash crisis. Water bodies are fast deteriorating due to poor farming practices like stream bank cultivation. Further to that, in many developing countries, only a few elites can afford to irrigate their crops but this is difficult to feed the entire population and ensure food security. As a result of poverty, people are forced to depend on the scarce natural resources and of major concern is the fact that people do not put efforts in replenishing those resources they will have used especially trees cut for energy and farmland.

This study also discovered that what the indigenous people cannot attain through proper farming practices on a small piece of land is recovered through clearing large tracks of land. This is a negative trend that has been going on in Zimbabwe. When land is tilled for more than seven years, it is deemed infertile and is left to recover for at least one year and thus people will clear new land for farming. This has been further compounded by the fact that farming inputs are far beyond the reach of many subsistence farmers. In preparation for the 2016/17 farming season, the Zimbabwean government embarked on the Command Agriculture programme meant to end food shortages, however, those who were responsible for implementing the programme tended to short change the intended beneficiaries by holding on to the agricultural inputs. More so, the problem is far from over because those who benefitted did not pay back to the government thus drying the government coffers. So, politicisation of government programmes has hindered meaningful progress in the country.

The figure below shows land clearing to pave way for farming a trend that has become habitual in almost all Shona communities. Prevalent is the rate at which people cut down trees but failing to plant other trees to replace those that they cut. This has also left the soil bare and highly prone to erosion.

Figure 4.10 200 hectares of virgin land cleared to increase tobacco hectarage.

Photograph taken by this researcher.

It has been observed that local farmers anticipate high yields through increased hectarage. This has seen vast tracks of land in Zimbabwe being cleared to give way to agriculture. In so doing, animal habitats are increasingly getting smaller thereby greatly affecting bio-diversity.

The other danger posed to the environment by agriculturalists is the use of chemicals to control weeds and pests. These have for the past decades had devastating effects on the environment and the ecosystems. These chemicals destroy organisms that are vital for maintaining the ecosystem in balance. From the fields where they are applied, they leave a trail of destruction on the soil through to the dams where they affect aquatic organisms. Not only are Agro-chemicals responsible for water pollution, poor waste management in urban areas has resulted in raw sewage flowing directly into the river systems and dams. Lake Chivero which supplies the capital city of Harare is badly affected by sewage flowing into the river from towns like Ruwa, Chitungwiza and the city of Harare (Kadani, Zimbabwe Sunday Mail, February 2016).

Further to that, it is sad to note that the developed countries are reluctant to transfer their technologies to developing countries citing poor governance practices and poor property rights records. It is difficult for the poor countries to acquire modern technologies without the help from developed nations. Despite poor nations having

contributed very little to the carbon dioxide emissions, they the hardest hit by climate change effects.

-Lack of public acceptance

Negative public perceptions on climate change are also contributing to delayed deployment of sustainable development paths. A major factor hindering public support for climate change mitigation processes is the fear for economic downfall and job security. Many governments fear massive job losses if they implement or move to clean energy sources with less carbon emission into the atmosphere (Joe, Interviewed on 14/12/17 in Harare). In Africa today, many countries depend on fossil fuels for energy and thousands of people are employed as coal miners. Many industries use coal as the main source of energy. Coal and gas are widely used and these resources emit more carbon dioxide into the atmosphere. As a result, the majority of people are reluctant to move to clean energy paths because of the immediate benefits from fossil fuels.

In the past, economic development had been largely dependent on burning fossil fuels. Coal is a major source of the greenhouse gas carbon dioxide which is a chief cause of climate change and is locally available in most African countries thus forcing many people to be reluctant to swiftly move to soft or clean energy paths citing the abundance of the resource locally. It has been noted in this study that poor countries have a tendency to focus much on the immediate economic benefits at the expense of the dying environment. From the political front, leaders fear losing elections if people lose jobs and this point to the fact that self-interests and selfish political persuasions hinder progress. The influence and interests of economic and political elites have led inequality in poor countries where political authority is used to entrench unfair advantages to those in positions of power. Access to justice is out of reach for many poor people because many elites use their influence to get government favours including tax exemption, land concessions and subsidies while blocking policies that strengthen the rights of many citizens.

-High capital costs

Investment costs are a major hindrance to sustainable development in Africa. Zimbabwe for example had complex investment demands that scared away potential investors which demanded foreign investors to cede 51 percent ownership to locals and them retaining 49 percent after the government gazetted that law (Zimbabwe Herald 17 May 2013). These stringent requirements are a deterrent for any serious investors. These counterproductive indigenisation laws exposed the Southern African country as an unsuitable investment destination (Garayi interviewed on 18/12/17 at the University of Zimbabwe). Consequently, it became difficult for the local people to initiate programmes that promoted sustainable use of resources without the financial assistance from foreign investors. Zimbabwe is currently experiencing severe foreign currency shortages making it difficult even for individuals to sustain their lives and ensure food security. Since livelihoods in Zimbabwe are agro-based, the cost of agricultural inputs is beyond reach of many such that the majority are not able to buy adequate inputs and irrigate their crops only to depend on rain-fed agriculture.

High taxation is another impediment hindering smooth migration from conventional fossil fuel use to renewable energy sources. With no industry producing finished goods for export, Zimbabwe depends on imports on many goods. Import tax is very high for individual and corporate organisations.

-Corruption

There is a remarkable difference between the developed and developing countries in terms of governance. The issue of accountability is far from being realised in most developing states. Zimbabwe has for years suffered from money laundering and externalisation depriving the country of the much needed foreign currency. Black market has thrived in Zimbabwe as if it was a normal way of doing business. The result was that all the goods and services became expensive to access (Garayi interviewed on 18/12/17). It became difficult for people to insure their properties against climate induced hazards and other dangers.

Corruption is a major problem that is prohibiting progress in addressing climate change issues. In Africa, corruption is a hindrance to many developmental projects since the intended beneficiaries do not benefit from assistance offered by government or Non-Governmental Organisations. In many parts of the developing world, corrupt dictatorships and economic elitism have contributed to income inequality and poverty (Beach 2017). In most government systems, bribery has become a necessary tool to access government contracts and many opportunities go to those with money to pay bribes. This has created a situation where a small number of people become richer while the majority are cast in deep poverty.

The Zimbabwean government embarked on the Command Agriculture which saw the country exceeding 30 percent of the country's maize output in the 2016/17 agricultural season. This fell short of the anticipated target despite paying huge dividends. The major factor was corruption. Much of the agricultural inputs were held back by political leaders for personal use. Some of the inputs got to the farmers late and this diminished the agricultural returns. Corrupt activities were brought to light with the coming of the new political dispensation led by President Mnangagwa which saw many political leaders being arrested since the level of corruption had reached alarming levels (Sabeta, Zimbabwe Herald 08/09/17; 08/01/18). Unfortunately, no action was taken to root out the cancerous problem definitively.

The diamonds in Marange in Manicaland province which could have helped in many development programmes were looted and the proceeds never got to the government treasury (Kunambura, Zimbabwe Daily news 01/01/18; 08/01/18). In light of this, there is no way through which mitigation and adaptation to climate change can be achieved because the international community will not give funding where there is no clear and sound use of resources. This is one reason why the developed countries are reluctant to transfer agro-technologies to developing countries for fear of financial abuse.

-Lack of policy consistence in property rights

Policy consistence is important to international cooperation and development. Public policy inconsistencies and contradictions in government is making doing business more difficult thus hindering progress in mitigation and adaptation of climate change.

Proper institutions and legal frameworks need to be put in place in order to aid investors understand the true picture of opportunities available.

A situation where foreign businesses are threatened with closure overnight only to be reversed the next day has deprived many African countries from foreign aid benefits. According to the 2013 World Bank's Doing Business Indicators, Zimbabwe was ranked number 173 out of 185 countries. The major impediments to investment included limited access to fair judiciary services, high capital costs, dilapidated infrastructure, obsolete technologies and basic utilities shortages such as electricity and water.

Property rights protection continues on a free-fall and has reduced the incentives for businesses to operate. Poor investment and unfriendly laws reflect serious underlying challenges ranging from policy and operational issues (Tambo 2015). Zimbabwe is one country with the best climate in the world that many foreign nationals want to invest in. It is a country that has a rich mineral base in Africa but the country's property rights record scared away investors. Property rights can be defined as, the absolute and exclusive rights to own something or, rules that govern one to use wilfully his or her resources as enshrined in law. The Lancaster House meeting of 1979 which resulted in the cease fire after the struggle for liberation Chapter III Section 16 stipulated that the new government was prohibited from acquiring land for resettlement except on willing buyer willing seller basis. In 1990, the willing buyer willing seller expired and the amendments that were made meant in principle that property rights lost its guarantees. With the amended constitution, the government had power to compulsorily acquire about 1472 white owned farms from the white minority farmers without compensation. This era made foreign investors sceptical and this has seen companies closing and many people losing their jobs.

-Poverty

The World Bank in its year 2000 report defined poverty as an unacceptable deprivation in human well-being that can comprise both physiological and social deprivation (https://www.imf.org). People living in poverty are forced by their circumstances to exploit the natural world, for their day to day survival is worth much more than the promise of a better tomorrow (Strydom and King 2009:41). Thus, for

daily survival situations, natural resources tend to be exploited with little regard for the future consequences even if they are well known and understood (ibid). It is therefore easy to observe that depending on the degree of poverty, even those resources that grow fast to out-compete conventional alternative investments might be subject to overexploitation by poor societies (ibid).

The macro-economic challenges continue to deepen in many developing countries. These challenges have led to significant retrenchments from the formal employment sectors leaving many households with high income insecurity. The majority of the people have resorted to vending in order to make a living. In Africa, many people depend on rain-fed agriculture and its related subsectors to produce food for their sustenance. With high unemployment rates, many people live well below the poverty datum line. A lot of rural people have for decades been depending on food aid from foreign donors. So this has made it difficult for the people in Africa to be able to adapt to the effects of climate change. Lack of, and poor access to, economic resources is the chief contributing factor to poverty in Africa and these include lack of basics such as energy, land on which the produce their food and clean water.

As a result of poverty, the majority of people are failing to attend school especially technical colleges for failure to pay tuition fees. Poor education results in poor management of scarce resources and poor land use resulting in low productivity and poor crop yields. Impoverished households are not able to send their children to school since children have to work in farms to help in supporting the family. This has created a continuous cycle of poverty where each successive generation will force children to work rather than going to school. In light of this, many people are not well resourced to be able to adapt to climate change problems.

Additionally, poor public health and poor environmental practices have led to increased diseases outbreaks and high mortality especially in infants and the elderly. As a result, focus is shifted towards health issues leaving out an equally important issue of environmental conservation. It has been observed that poor health care is partly responsible for population growth in poor countries. Many people do not support the idea of having few children. Their fear is premised on the fact that, “if you have two children and they die you are left with nothing”. These fears have been

exacerbated by the infant mortality rates in poorest communities since they have no access to health facilities hence the population boom.

Further to that, poverty has also made it impossible for the majority of people to access clean energy sources like solar power. Dependency on forests for energy has risen to unprecedented proportions. The rate on which the forests are being cleared for energy is disturbing. Instead of conserving the forests, people are heavily destroying the environment.

-Economies driven by unbridled political forces

Africa has been affected by the leadership crisis for decades. Most leaders are not able to provide their people with basic necessities for survival like food, shelter, health and security services and thus continue to depend on donors. So widespread is the loss of trust with the judiciary system and law enforcing agencies. Most African leaders are reluctant to adopt science and technology development and have not been able to transform their economies still relying on raw materials exports with little or no value addition instead of exporting finished products.

In most African countries, political leaders have greater control and influence on the economy to the extent that corruption goes uncontrolled. Citing as an example the case of the then Zaire leader, the issue of former Congo dictator Mobutu Sese-Seko is one case in point where political leaders looted state resources at the expense of the public. The problem of undemocratic practices and tainted records in rule of law has forced many in developed countries not to give direct assistance since there is fear that the funds will be diverted from its intended use (https://www.washingtonpost.com).

Unconstrained political demands have destroyed many African economies and hindered climate adaptation, mitigation and progress. Restricted freedoms and increased political control of the state undermines social and economic stability and thus increasing the risk of geopolitical and social conflict. Those who have more political power have greater access to national resources as compared to those with no political influence. Empowered by new and sophisticated technological tools in areas such as surveillance, many governments and decision makers around the

world are tightening their control over civil society organisations, individuals and other actors. These restrictions are ostensibly intended to protect against increased security threats, but potentially threaten the existence of an open and free society and the stability of the environment in which businesses operate without fear of government takeovers (reports.weforum.org>global-risks-2017). As a result, state resources are looted instead of them being distributed equally among citizens. In light of this, governments are bound to fail to address critical issues of the environment in favour of self-enrichment.

-Exclusion of local people in policy formulation and implementation

The World Bank and the International Monetary Fund (IMF) as well as other multilateral and bilateral financial lending institutions are fully convinced of the inextricable relationship between good governance and sustainable development (Centre for Peace Initiatives in Africa 2005:14). These and other international financial institutions and aid agencies regard good governance as essential preconditions for sustainable development and access to international aid (ibid). The developed nations emphasise the application of democratic principles through the promotion of representative political processes and the growth of a vibrant civil society and respect for human rights. It is through democratic practices that funds from international financiers are put to good use that will pay the desired dividends to the entire people of the recipient country (ibid). Effective operationalisation of public institutions together with meaningful partnership with civil society and the private sector is important for any country to meet its developmental objectives (ibid).

Religion is often regarded as the most explosive issue in politics and contributes a great deal to the structuring of opinion and therefore must be included in governance issues (Roskin et-al 2006:138). However, the case is different in Africa where politicians discourage religious participation in politics. In Zimbabwe, the former president Robert Mugabe would visit apostolic churches towards election time in order to secure their vote but when it comes to policy formulation, they are side-lined and instructed not to meddle in politics. Nearly all apostolic churches in poor communities voted Zanu PF in previous polls and because of their numbers it was difficult for opposition parties to defeat Robert Mugabe whose policies were not

developmentally friendly. Despite religious organisations participating in universal suffrage, they are left out when it comes to policy formulation. The exclusion of religious actors in public policy deliberations deprives it of the spiritual and divine unquestionable authority and godly insights needed for harmony to prevail.

With the growing opposition against his government, Robert Mugabe decreed that religions must leave politics to politicians. This came after the churches complained of continuous suffering of Zimbabweans. This is prevalent in almost all African nations that religions and civil society are left out of political establishments.

4.10 Conclusion

In conclusion, this chapter explored the research findings of this study. It was observed that both religions under study are capable of influencing ecologically friendly attitudes to their followers. Most importantly is the fact that religions are anchored by divine authorities which compel adherents to respond to religious calls to conserve the environment. The concept of *ubuntu* is pivotal in that it encourages people to conserve the environment by making use of that which they need to use and protect that which they do not need. This study also observed that not only Christianity and Shona religions are environmentally conscious. Other religions of the world mentioned above showed that they have ethics that encourage conservation of the natural world.

Further to that, traditional religions are rich in Indigenous Knowledge Systems that have enabled communities to realise food security at the same time conserving the natural world. This is necessitated by the help from traditional leaders who are the custodians of the land. The study noted that these knowledge systems were developed on observable phenomena over time, thus ensuring their reliability. Noteworthy is the observation that IKS's need to be complimented by scientific weather forecasting methods to improve forecasting data. Unfortunately, it was noted that the Meteorological Service Department is failing to secure modernised technological equipment that provide accurate weather information thereby prejudicing society.

Also noted were the barriers to effective mitigation and adaptation programmes. These barriers include information technology gap, lack of public acceptance, capital

costs, corruption among others. There is need to overcome these barriers and obtain the full benefits of renewable resources to curb the effects of global warming and climate change and move to sustainable development requiring rapid action by governments, private sector, religious groups and individuals. Action up until now to curb and mitigate climate change as embodied in the Kyoto, Montreal and other global protocols has not been adequate and has been beset by many political barriers based on self-interests of different countries rather than on the shared interests of resolving the planetary scale risks to everyone's benefit. As a result, policies are needed urgently that will enable just and definitive solutions to climate change and poverty reduction especially for the protection of the poor and vulnerable people who are facing danger from the impacts of climatic changes and are not able to escape poverty and malnutrition.

Chapter 5
Evaluation

5.1. Introduction

The previous chapter presented the research findings of this study which unveiled the potential in religions to help communities mitigate and adapt to the changes in climate. As has been indicated, religion is a key factor in climate change mitigation and thus requires recognition in policy formulation and environmental governance. Throughout the history of mankind, humanity has tended to exploit and alter the environment beyond the limits of its resilience. Human excesses in consumption, emission of dangerous gases into the atmosphere, deforestation of forested lands, unsustainable agricultural practices and production among many human activities have caused devastating effects in the atmosphere (www.science.org.au). Given the significance of human behaviour as the major driving force to modern ecological problems, efforts to promote global ecological and economic sustainability must include attempts to understand and adopt social, religio-cultural and public perceptions towards the environment.

The world continues to witness unbearable weather conditions whose onslaught is a grave threat to survival of all human, animal and plant species on the planet with some parts of Southern Africa facing perennial droughts while other parts facing floods. The current trends of development and consumption indicate of way of living that does not take into consideration the needs of generations to come which is a dangerous and exploitative precedent that is being set. It is in this context that, this chapter intends to critically evaluate possible contributions of religions to climate change mitigation with the view of ascertaining the orientation of humanity to environmental preservation, and engendering ethically and morally eco-friendly attitudes towards the environment in order to preserve all life support systems on planet earth for sustainable development and benefit future generations.

5.2 The Interface between Religion, Science and Sustainable Development

The need for religion to work hand in hand with science is important despite having been highly contested in the field in global development programmes in this scientific age. The major cause of religious opposition is the Secularization thesis. The Secularization thesis refers to the widespread assumption in the social sciences that,

as societies modernize, religion loses its significance in the public space and in all aspects of social life (Berger 2000:443). Fathers of sociology, Emile Durkheim and Max Weber established an inverse relationship between modernity and religion arguing that with modernity rising, the sacred is assumed to lose significance and the secular becomes more prominent, what Weber called the disenchantment of the world (Weber 1966:124). In line with that thought, religion no-longer explained the world but rationality did. Thus when societies undergo a process of modernization and rationalization, it is believed that they also undergo a process of secularization, a process in which religion diminishes in importance both in society and in the consciousness of individuals (ibid). Religion's loss of significance was generally expressed in falling numbers of attendances at religious occasions especially in Europe. However, the secularization thesis which assumed that religion would disappear from the people's lives as they acquire wealth and become rich and which has underpinned the way Western societies conceive religion, has come under heavy scrutiny in social sciences and religious circles (ibid).

Despite external attack, religion has not disappeared from the public space either in the developed or developing world. In the period 1978-79, the Iranian Islamic revolution overthrew the Shah Monarch and established the Islamic Republic of Iran. This is a case in point where religious beliefs have growing influence in social and political spheres. In fact, there is a global resurgence of religion, religious fundamentalism is on the rise in Islam and some Christian denominations. Religion is increasing its influence in public life for many people and this influence must be tapped to help communities deal with the changing climate. In order to effectively commit people to environmental care, it is critical to understand their religion and attack the mitigation programmes from a religious point of view. For example, all Muslims are strongly influenced by their religion from family to community and national relationships and most other aspects of life (Jacobs 2003:29).

Furthermore, the influence of religion as a moral factor in people's lives, world politics, administration and in the global climate change mitigation drive must not be underestimated because at the core of religion lies a deep understanding of what it means to live in harmony with the rest of creation. This is evidenced by the concern for the environment shown in religious traditions. For example, Shona people's

connection to the land as indicated in chapter 3, this shows that land is not only an economic resource but a home and place for sacrifice is a clear pointer that religion is important in nature conservation. Despite some notable different notions among religions especially on materialism which is prevalent in Buddhism, concern for the environment is a priority.

Climate change as indicated in chapter 2, is negatively altering ecosystems and other life support systems affecting human livelihoods in ways eliciting urgent religious responses. The role of religion in influencing human understanding, morality and positive attitudes towards environmental care programmes must be taken seriously by policy makers. People willingly take measures to protect that which they view as sacred to the extent of them refusing financial and other material gains and waging wars to defend their values and customs. Religious values shape people's identities, attitudes and outline human responsibilities in a way that the secular world cannot do. So, the inclusion of religion in climate change issues is of paramount importance.

The significance of religion in the climate change debate lies in the critical light cast upon the need for serious attention to conservation ethics and the moral role it plays in environmental conservation (Palmer 1990:50). The views that have been brought forward by social scientists on conservation of the environment are all value-laden and this has been ignored by many exponents of conservation and development and as a result, the intended goals of climate change mitigation are not realised. Social sciences and politics have failed to understand that in their efforts to save the environment, they are deeply immersed in religious and cultural presuppositions. Failure to work together between social sciences, politics and religions, a new ethic embracing humanity, animal and plant species that fosters harmony on earth with the natural world on which all depends for survival and well-being, conservation objectives will not be achieved (ibid). Therefore, the long term task of environmental education must foster and reinforce those attitudes and behaviours compatible with an environmentally friendly ethic such as those conferred on humans by religion.

For many decades, no attention has been paid on human values, belief systems and practices in favour of science based conservation ways and no meaningful progress

was made. This is evidenced by the worsening environmental situation in the world especially in poor countries and vulnerable communities who find it difficult to adapt to extreme weather changes. The major problem was that, scientific conservation movements ignored the role of religious belief and formal religion in modern civilisation. The encounter between religion and conservation has been regarded as counterproductive. Despite the opposition, conservation movements often make use of language and symbolism derived from the very core of religious faith, as such, the need for collaboration between religion and science need not to be overemphasised to save the environment from further damage. Primal religious communities who lived close to nature provides insights on how best humanity can live in harmony with nature especially on the notion of interconnectedness of all creation.

Natural scientists and politicians have worked very hard in their efforts to mitigate climate change by giving out information on the possible irreversible dangers that may soon befall humanity if no action is taken now. In 1988, the Norwegian Prime Minister Gro Harlem Brundtland, while opening the World Conference on the Changing Climate called for a new holistic ethic in which economic growth and environmental protection go hand in hand around the world (Engel 1990:1). Brundtland was the chairperson of the United Nations Commission on Environment and Development and had hopes that human survival and well-being could depend on the success in elevating sustainable development to a global ethic. However, for many decades, climate change meetings were held at global levels for example the Rio Summit in Brazil on 3-14 June 1992, the Paris Agreement on 12 December 2015 in France and many other meetings but no definitive solutions have been realised up to date. The reasons behind the failure vary but have major influences on global development processes which many political leaders are not willing to adjust for selfish benefits. For example, it was never clear on these gatherings on the exact kind of economic growth that was intended and also these gatherings lacked inclusivity.

Economic gains have been given much attention at the expense of sustainable development to the extent that Western governments and major polluters of the environment are refusing to ratify the global climate change pacts. Many powerful nations have offered to limit carbon dioxide emissions but their offer has remained

purely open rhetoric. Unless secular institutions, national governments, international non-governmental organisations and other institutions taking part in climate change programmes are willing to acknowledge and accept the role of religion in environmental issues and education their efforts will remain incomplete.

Religious traditions have rich reserves of ideal environmental care programmes that when they are put together with science based values, the earth's self-sustaining balance is restored. Religious and cultural traditions have without question influenced the way in which modern societies impact the environment and shape the world's economic institutions. For example, Christian organisations have been in the forefront helping communities affected by famine with food aid and clothing with many Christian volunteers helping in disaster affected regions especially during the Zimbabwe 2008 election re-run period (Murowa interviewed on 25/03/18 in Mvurwi). Given the role religions have played in the course of humanity`s history to sustain complex human communities for many generations, it is not surprising that in response to the modern needs of humanity and the environment, religions are helpful in the quest for finding and nurturing sustainable ways of life and the responsibilities to engage with others in the global efforts to save the environment for posterity.

According to Engel (1990:12), the moral failure of human beings to live in peace and harmony with one another and the rest of creation is rooted in the deep spiritual failure. The human will is cast in deep bondage to forces of evil and structures of reality that alienate it from the true ground of its being. This human bondage is evident in greed, selfishness and the insatiable appetite for pleasure, wealth and power that are real motivating forces behind dominant materialistic world views (ibid). Alone, natural scientists cannot influence the world to moral action and put the world on a sustainable development path. For the religions of the world, a complete change in the human will and deliverance from the spiritual bondage is a necessity in order to restore the relationship between humanity and the created world and foster sustainability.

The reluctance by national governments and other international agencies to seriously include the environmental dimension in national developments has

relegated the sustainable development issue a mere universal talk. Not much has changed in the world's development policy and this scenario will lead to dangerous consequences that humanity will not be able to handle or reverse. Destructive economic paths are pursued without considering the rate at which the environment is destroyed. For example, the market economy is given precedence in organising the way how society is shaped. All people want is to amass wealth without the willingness to forgo economic privileges they enjoy, what economists call neoliberalism. Thus politics and science alone will not work out a definitive solution to climate change problems because the ethical dimension which calls upon people to treat the natural world as equally important as all created things is lacking.

5.3 Religious conservatism

Conservatism implies the desire to conserve as reflected in its resistance or somehow suspicion to change. The central and recurrent theme of religious conservatism has been and continues to be, its defence of traditional values that have seen generations before taking good care of the environment. Tradition refers to those values, practices and institutions that have endured the test of time and have been passed from one generation to another and it is anchored on religious faith. From the point of view of Judeo-Christian religions, the world was created and fashioned by the creator God. As a result, all customs and beliefs systems are God given, a belief that is strongly held in religious circles. Therefore, when humanity negatively tempers with the world, it is a clear challenge to the will of the creator which religion will not tolerate. As such changing things for the selfish benefit of individuals at the expense of God'ss creation will not be tolerated in religious establishments.

According to Heywood (2007:69), tradition reflects the accumulated wisdom of the past, the institutions and practices that have been tested by time and must be preserved for the benefit of the living and for generations to come. He further attests that, "this notion of tradition reflects an almost Darwinian belief that those institutions and customs that have survived the test of time have only done so because they have worked and have been found to be of value having been endorsed by a process of natural selection and demonstrated their fitness to survive" (Heywood 2007:69). The value of religion in environmental conservation and moral standing of

humanity is critical since it generates for both the society and the individual a sense of identity that no one is willing to lose. On one hand, Christian religion is inspired by its primary text the Bible that God demands humanity to conserve the environment. On the other hand, tradition has provided the Shona people with a feeling of rootedness and belonging which is all the stronger because it is historically based and they generate social cohesion by linking people to their roots. In so doing, it provides a platform for peace, security, solidarity and harmony which are vital bases for sustainability.

Independence and individualism are legal rights of people but they have caused disintegration of society and destroyed mutual cohesion of humanity with other beings. Caution must be taken in enjoying these rights lest humanity lose the right track to environmental conservation. The impact of cultural distortions where people acquire modern and consumptionist values relegating those values passed from generations, and the need for some people to move far from home to earn a living have tended to weaken societal ties. These ties are important in creating a social bond where no one would deviate from set principles of conduct. Religion therefore comes in to reinforce these social ties and maintain harmony. Religious communities are able to create social bonds for example in churches, members become one family in faith replacing blood ties. Thus, when religion maintains peace and harmony in society, it can also encourage people to care for the environment.

5.4 Religion as a climate change coping mechanism

Religions have played important roles in helping people to cope and make sense of tragedy, suffering and loss (Sachdeva 2016). Responding to psychological and physical problems with prayer in Christian religion and turning to God the ultimate authority has proved to yield positive results (ibid). Religious beliefs and practices have been very effective in promoting human healing in the event of natural disasters since they provided an existential framework helping people to justify loss, droughts, severe weather events among many more as a result of the acts of God situating natural disasters within a larger plan. In 2004 for example, a Tsunami hit South Asia and the Buddhist teachers gave naturalistic explanations relying on traditional Buddhist teachings. They emphasised that while suffering is innate to humanity, one must take action and alleviate suffering by taking responsibility for

their actions and taking into consideration consequences of their actions (Falk 2010:96). The Muslim leaders explained the disaster in terms of Allah's wrath due to human sin by punishing people (ibid). In light of this, religious adherents are convinced that right conduct must be always upheld.

Religious beliefs, practices and explanations have helped people to effectively deal with the problems of life and provide the ways to cope with them. Their inclusion is thus of great importance in the climate change discourse as they can help to build synergies which no single discipline can accomplish without collaborating with other disciplines. A comprehensive research that was conducted in 2006 indicated that the slow and inadequate societal response to the looming environmental catastrophe has been the isolation of environmental scientists from other disciplines (Nisbet et-al. 2006). Appropriate technical information that is offered at the right place and time is enough to motivate people to action that is when they are actively involved. A more diverse, interactive and participatory engagement enables the climate change discourse to be effective and yield definitive results. In traditional religious circles, people believe that, with collective and communal ownership of development programmes, humanity achieves the desired results (Moyo interview 03/06/18 in Hurungwe). It is in this respect that the local levels of society must be actively involved in climate change programmes as participants because religions have the ability to engender positive attitudes based on the unquestioned authority of the Supreme Being who is believed to be the source of all forms of life on planet earth.

Figure 5.1 below presents the current trends in environmental conservation versus the ideal approach needed to collectively mitigate challenges posed by global warming. As long as there is no collaboration and collective involvement of all disciplines, it will be difficult for the world to come out of the current dangers and adopt a sustainable way of doing business.

Current approach to climate mitigation efforts.

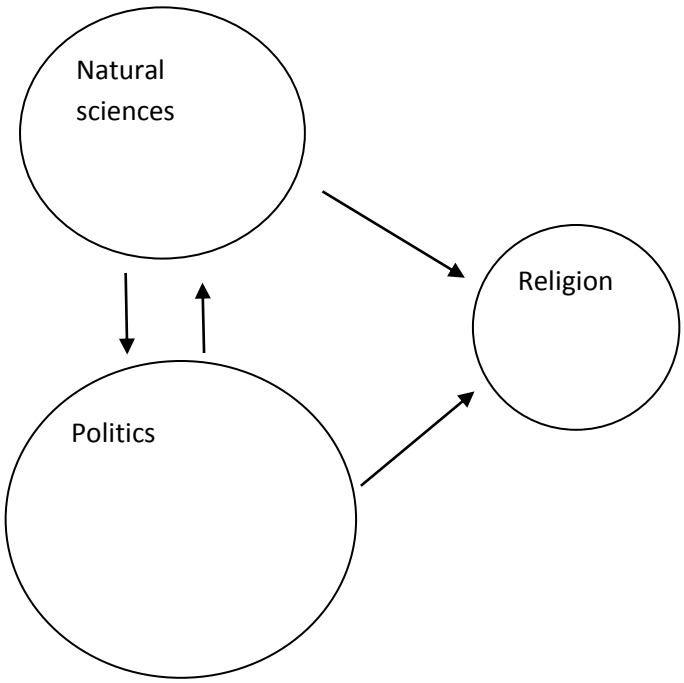


Figure 5.1 Lack of collaboration between Natural sciences, Politics and Religion.

Diagram drawn by this researcher.

As presented in the figure above, there is reciprocal interaction between Natural scientists and politics but there is no religious input to the two groups. Politics occupies a larger space because of political authority, power, influence and control which is not the case with scientists and religions. These are the major concepts of politics without which a politician will not survive. Absolute power has corrupted many political leaders to the extent that what they feel is the right way prevails. As a result, the scientifically proven warnings form scientists on impending climate dangers are taken seriously. This is because of the political influence that is held by state actors to induce other groups to act in some ways they would not have acted if they were not induced.

Natural scientists made investigations on the effects of human activities on the environment and provided comprehensive action plans to be taken. They warned that if no action is taken now to correct the human wrongs, catastrophic consequences are certainly to befall humanity. They relayed the information to politicians who in turn responded pledging their support. Further to that, information

was given to religious communities and other sectors but religions did not get room to offer their views. From the figure above, politics occupies a larger portion which includes decision making and policy implementation. The major concern for political leaders is job creation, efficient service delivery which in return guarantees electoral victory, a scenario that is prevalent in most political establishments. No ruler can survive without significant support from some groups whose interests will always be considered. In so doing, environmental damage continues. For example, in complex industrial societies and even in developing countries, governments must have general support of special institutions like the military, the masses and industry leaders. In order to strike a balance, the interests of influential groups are best taken care of. So anything that appears to be anti-development is not seriously taken into account.

The Ideal Inter-disciplinary approach.

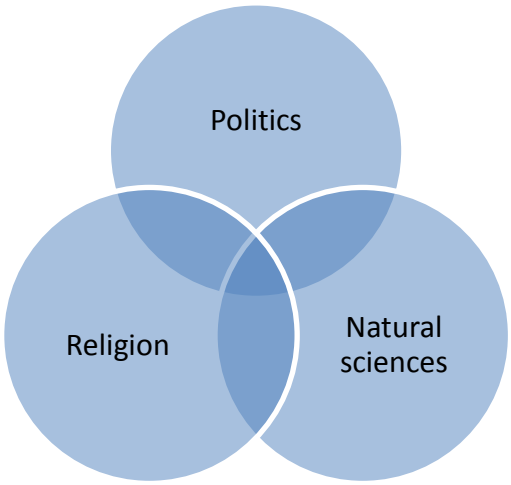


Figure 5.2 The much needed collaborative approach in climate change mitigation.

Diagram drawn by this researcher.

If the world is able to collaborate in a way presented above, issues of environmental conservation will succeed. A compromise is needed so that all people come to a common understanding that is rooted in ethical and moral environmental responsibilities.

As has been said in chapter one that, climate change is a moral issue, the moral factor has been ignored in the global fight against climate change resulting in the

worsening of the environmental situation. The information on the dangers of climate change is available but to those who have access to it. Possible options to take are available especially the use of sustainable and renewable energy paths but are costly to the majority of the poor people. But the major thing lacking is the moral dimension which calls upon humanity to view the created world with reverence and avoid human-centred development approaches and religion is best suited to address those issues.

5.5 Sustainable Development in the face of Industrialization and Globalisation

It the quest to improve people's livelihoods, create employment, feed the population, provide health care services among many social services and amenities, developing and poor countries have no choice but to industrialise. The major drawback in this development plan is lack of capital, poor technological power, poverty, poor governing structures among many obstacles hindering development. As alluded to in chapter 2, all production activities will continue to be powered by burning fossil fuels thereby adding more and more tonnes of carbon dioxide into the atmosphere further increasing the already bad environmental situation. The reason for continued use of fossil fuels is their availability in most African countries. A change of mind-set is needed especially in poor communities whose need for development is high.

For decades Africa has been lagging behind especially in areas such as manufacturing. In developed nations, their development patterns are very clear, they add value to all goods they produce but in poor countries, raw materials are exported thus relegating Africa to the bottom of the global value chain. For example, Zimbabwe has been exporting chrome to China without value addition for the past 10 years at a time when the country needs foreign currency. On the other hand, many African counties are exporting wealth to overseas nations and the revenue realised is benefiting a few elite leaving the majority of the population in abject poverty and vulnerable. To survive, the poor and vulnerable are forced by circumstances to depend on the natural world and the means to extract resources have profound impact on the environment and such activities like gold panning, deforestation, poor agricultural practices among many more will increase.

Industrialising Africa is one of the key issues the continent needs in order to effectively deal with issues of poverty. The population is fast growing and the demand for consumer goods, food and other financial services is increasing. These are the factors that make the African continent attractive for investment since the continent has a rich base of natural resources. However, if this proposition goes unchecked, there is the danger of furthering the damage that is already done on the environment. The major obstacle to the industrialisation of Africa lies in the sustainability of the process. According to Santa Ana (1998:4), there is need for humanity to recognise the limits inherent in creation and therefore adapt her claims on the future to a course which can be sustained to benefit future generations. While each generation constructs its own life and alters the face of the earth, no generation should change the quality of the conditions of life on the planet so profoundly as to deprive future generations of major possibilities to build and construct their lives and alter the face of the earth in their own right (ibid).

The possibility of irreversible damage to the environment is very high if there are no clear policy structures to govern industrialisation in developing countries. Developed countries attained wealth through the wide usage of fossil fuels and this contributed to the accumulation of carbon dioxide into the atmosphere and the effects of it are now being felt and they are slowly increasing to extremely dangerous levels as evidenced by rising temperatures and recurrent heat waves. Sustainable processes of industrialising Africa and the rest of the poor communities in the world must see to it that resources are consumed no more rapidly than renewable substitutes can be found, and that waste matter is discharged at a rate no greater than it can be managed by nature or by human devices (ibid). This is enabled by morally and ethically sound policies that do not harm the natural world further.

There is danger of exhausting the finite resources in the process of improving the livelihoods of the communities. The reason behind this is that, the need to consider the future generations generally take second place. People tend to consider themselves first and the individualistic nature of modern human existence has led to exploitative lifestyles. As a result, governments must play a leading role in upholding the policies that support sustainable use of natural resources in addressing human needs and alleviating poverty.

5.6 Historical successes of Religion in correcting human wrongs

Despite being blamed for the ecological crisis being experienced today as has been referred to in chapter two, religions have provided some moral functions that have helped humanity to take good care of the environment. In Judeo-Christian history, it was legitimate to enslave captives obtained from warfare and children were sold into debt bondage. As with the Hittite laws and the code of Hammurabi, the Bible does set minimum rules for the conditions under which slaves were to be treated as part of the extended family in Exodus 2:1-11. However, despite this and other instances where religions propagated inhuman acts against those who were vulnerable, there are many historical antecedents where religions won battles against social injustices. Religious revival in Europe condemned slave trade as being opposed to the law of God and humanity and this saw many Christians and the general population in Europe freeing their slaves. Humanitarian, political and economic considerations also encouraged the abolition of enslaving humans.

There are also some historical precedents in Africa that enabled social changes by religious groups. Religious groups in Africa helped to end civil wars in countries like Mozambique, the Democratic Republic of Congo (DRC), Angola, Liberia and Zimbabwe. The Christian Council of Mozambique engaged the warring parties and in 1992, the Peace Accord was signed in Rome ending the war (https://berkleycenter.georgetown.edu). The All Africa Conference of Churches was actively involved in the 1997 conflict in the DRC by advocating for peaceful political change, respect for rule of law and people's rights throughout central Africa. On the 4th of April 2003, the people of Angola celebrated the first anniversary of the Memorandum of Understanding signed between the Armed forces and UNITA forces which brought a new era of peace in that co untry (Comerford 2007). The interventions of Angolan churches enabled attitudes of tolerance and mutual understanding and peace prevailed. The 1982 to 1987 Zimbabwean conflict demonstrates how the church got engaged in search for peace after an arms cache in PF ZAPU owned and controlled properties igniting the so called dissidents problems. The Catholic Church and the Zimbabwe Council of Churches were at the forefront on peace initiatives where they analysed the causes of the conflict and the value for peace and encouraged the warring parties to reconstruct their broken

relationships and forge a new and better vision for the nation (Catholic Commission for Justice and Peace in Zimbabwe 1997). Religion awakened the spirit of brotherhood which provided moral underpinnings. The Roman Catholic Church was the first to make contacts with the then state Prime Minister Robert Mugabe and Joshua Nkomo the PF ZAPU leader.

The Catholic Commission for Justice and Peace (CCJP) chaired by Bishop Mike Orate presented comprehensive and irrefutable evidence of the disturbances in the western parts of the country. The heads of denominations urged the Prime Minister of the need to respect multi-party democracy in the country. On December 22 1987, Zimbabwe's political landscape dramatically changed with the signing of the unity accord and the so called dissidents were reintegrated into the society.

There is no doubt that with mutual agreement amongst all actors in fighting climate change related effects, victory can be achieved. Religions have proved to be a vital institution in enforcing ethically informed attitudes towards the environment. The authority enjoyed by religious leaders over large numbers of people is critical in transforming the world to institute eco-friendly ways of production and save the environment to also benefit future generations.

Any action on mitigating climate change confronts humanity with serious issues of fairness and responsibility across individuals, nations and the rest of nature. Humanity is faced with a moral dilemma on a global scale because once the greenhouse gases are emitted, the effects are felt anywhere on earth regardless of the source of pollution. Some countries have least contributed to the global warming problem and continue on a low level of emission but tend to suffer the most and as a result this casts a shadow of unfairness thus lessening the likelihood of global cooperation. Moral and political considerations have been initiated by different countries outlining the obligations to be taken but failed to produce definitive solutions. Political leaders have for decades failed to cooperate and offer lasting solutions to climate change problems because of perceived political benefits like retaining political power at the expense of environmental care. In light of this, religions have proved to be able to unite people and impart positive actions where people cooperate for the collective benefit of all. For example, the Dalai Lama as

referred to in chapter 1, encouraged people to refrain from abusing the natural resources with success. As a result, decision making should no longer be a preserve of political leaders but must be from the people where politicians derive their political power through suffrage.

Time for the world's governing institutions to prioritise religion's ethical and moral considerations and include social climate change implications alongside political and economic needs has come. For decades, political and economic needs were given first priority but time has come that development policies must shift towards sustainable development thus highlighting the need for collaborative action (www.theconservation.com). For effective and definitive moral resolutions to be realised, religious considerations must be factored in and exercise its transformative roles. Religious beliefs and practices influence people's attitudes and behaviours which in turn has a profound influence on the development process instrumentally.

Development is a value based enterprise, therefore religion infuses the values that guide the development process including the behaviours and decisions of actors in the political, social and economic organisations. Within the human development paradigm, religion has ceased to be an insignificant factor but has become an essential component of a sustainable development process. For example, according to the World Bank estimates, 50 percent of health and education services in Sub-Saharan Africa were provided by faith based organisations in 2000 (World Bank 2007 report). The role of religion is no longer to be viewed negatively but must be recognised as shaping people's moral values and that which they observe as desirable and worthy of pursuit.

5.7 Religious contributions to climate change mitigation

The world is in a global crisis that is caused by climate change. Judging by the worsening situation, science alone will not save the planet from global warming. Traditional religions have rich reserves of knowledge and lived experiences that are critical in climate change mitigation. Indigenous peoples have interacted with their environments in a way that posed no danger to all creation. Religion played an integral part through beliefs, taboos and values that were formulated by locals in line with environmental protection. The values were reinforced by human experiences as

they observed the natural world through the seasons and Hunn (1993:13), argues that these experiences were, “tested inside the rigorous laboratory of survival”.

Having noted the influence of religion on human lives, it is critical at this point to explore the ways though which religion can contribute to managing ecological crisis by looking at those religious practices that give value to the natural world. Many hindrances have been faced in the area of climate change mitigation and adaptation because some existing mitigation strategies and programmes to address climate change fall short of taking into consideration essential religious and social dimensions of life that are fundamental to religious people. First is the African people’s connection to their land. During the primal times that earlier before the dawn of technology, people lived mostly on food gathering and the primal societies had a close religious relationship with the natural environment (Smart 1973:28).

Just like other religions in Africa, Shona religion has its own control measures relating to forests and lands with inclusive frameworks that incorporate codified rules, taboos and norms. These rules and values influence the organisation of the local environment and regimes of resource utilisation (www.ema.co.zw). For example, in traditional Shona religious beliefs, burial sites are accorded with special reverence because of their status as the resting place for the deceased. These places are held to be sacred and extraction of natural resources in such places constituted gross violation of sacred space and could attract heavy penalties for those found guilty. Upholding these beliefs at local levels helps the communities to appreciate and be directly involved in environmental care. Traditional belief systems have the ability to inspire humans towards sensitive and caring values and positive attitudes thereby promoting environmental conservation.

Secondly, the body of knowledge that has been passed on from one generation to the next has provided the basis for problem solving for local peoples. What local communities know and have can help in improving our understanding of those communities and provide them with relevant productive facilities designed to help in mitigation programmes. Understanding and accepting what the local people know is key to their responsiveness. Basically, inclusion of traditional knowledge in

environmental conservation is an important mechanism that ensures efficient and sustainable use of natural resources giving room for nature to replenish itself.

In Shona religion, traditionally protected sacred forests have a significant conservation value for human, plants and animal life. Its sacred aspect is important as it upholds continued environmental protection. There is an inter-connectedness between humans and nature in Shona religion that must never be destroyed. These forests are viewed as givers of food, meat, water and medicinal herbs and therefore are to be treated with utmost due care. The problem humanity faces today is that of using natural resources for profit making rather than for survival. The Shona people have lived in harmony with the environment utilising natural resources without affecting nature's capacity to regenerate itself. Their way of life was deeply sustainable and it is through these values and practices that Shona people were guided in their relationship with the natural world.

Shona religion cultivates a collective spirit of oneness among its adherents as they come together for a common cause like prayer, safeguarding forest lands or rainmaking ceremonies. Whatever happens in society is met with collective response where people gather and deliberate as a community and at the centre of Shona religion and cosmology is the Supreme Being who controls the universe (Makaudze and Gudhlanga 2014). The spirit of communalism binds society together and in so doing, no one will deviate from the expected societal morals. The same applies to environmental conservation, there is need for collective action by all as demonstrated in the communal unity of the Shona religion.

According to Idowu (1967:37), in all things, Africans are religious and for the African to be, is to be religious. This serves as a demonstration to show how critical religion is in the lives of African people. Human action is viewed alongside religious expectations and directed by religious observances. It is important for religions to assume teaching roles and educate people on the importance of environmental protection based on the understanding that humanity is not superior to, but part of, the environment which must be given room to sustain life on planet Earth. Shona religion informs the way its adherents regulate their relationship with their

surrounding world and fellow beings. The way Shona people relate to sacred forests, water and land cannot be ignored.

Sacred elements of nature have influenced people to fully commit themselves to the environmental cause especially those elements that emphasise conceptualisation of humans as stewards of natural resources. In the case of Shona people, they believe in the creator God and the ancestors locally referred to as *vadzimu*, who are resting in the underworld and in control of it. As a result, grave yards are protected as the resting place for the departed relatives. Trees and other natural resources in those areas are not cut. Religious values have influenced human behaviour towards protecting sacred forests to this day.

-Didactical preaching

Christianity has for decades been spreading religious knowledge to many people around the world. Congregants respond positively to Christian teachings and the response was and continue to be influenced by the belief in divine authority. These teachings have played an important role in ensuring harmony in communities. In order to fully strengthen the effectiveness of Christian teachings, it is proposed in this study that Christian religion must transform its preaching and embrace the didactical aspect targeting environmental issues. From the Greek *didaskein*, it is a practical application of teaching and learning and is intended to convey instruction. Religious leaders such as priests, bishops, preachers and administrators being authoritative figures must encourage environmental teachings in all Christian gatherings. In this way, people are aware of critical issues needed to save the environment. This based on the findings from chapter 4 where so many professing Christians indicated that they do not know anything to do with Climate change especially the Apostolic churches.

Religion is one of the most powerful social forces because of the profound ways through which it shapes people's perceptions of the world creating foundational aspects of human identity and place in the created world. Religious practices that maintained sacred forests and groves have been more effective for many generations. However, environmental damage is not subsiding, each day humanity witnesses continued degradation of the environment. Religion continues to be

overwhelmed by political establishments and governors. It is therefore critical for religions to partner with policy makers in order for them to appreciate environmental protection values inherent in religious teachings that motivates environmental action and align environmental governance laws with religious values.

5.8 The way forward: Towards a common environmental goal

Environmental protection goals have been set up in many countries with the aim of minimising environmental damage. But as long as human civilisation with its technological advancement continues on the same patterns that encourages domination and exploitation of natural resources for short term personal benefits, this juggernaut will continue to devastate the earth no matter what any of us does (Gore 2007:269). It is high time humanity takes bold and unequivocal action and make environmental conservation the central principle for civilisation the world over. The situation that is prevailing calls upon humanity to come to terms with exactly how the world is sufficiently aroused by a shared sense of urgent danger, and join in an all-out effort to halt the rate at which the world's natural resources are being exploited and initiate ways that safeguard the natural world.

It has been indicated in chapter one that science alone has failed to offer definitive solutions to the problems posed by global warming. A collaboration between politics, science, and religions is critical because the development of scientific ecology altered human understanding of the natural world and the place of humanity within it (Heywood 2007:260). Thus, for ecology, the notion of humankind being the master of nature is opposed, and instead it promotes the idea of a delicate network of interrelationships that had hitherto been ignored. In a sustainable development plan, fossil fuels and gas no-longer have space in long term sustainable energy paths that emit less greenhouse gases into the atmosphere. They must be replaced with renewable sources of energy. All this requires humanity to consider first the outcome of their actions and be considerate to the environment that sustains life and those yet to be born.

Humanity must agree to work together towards promoting environmentally friendly attitudes and considering the importance of local based environmental care programmes. There is no doubt that with sufficient agreement on sustainable

development options, humanity is able to achieve the much needed environmental protection goals of reducing pollution, stabilising world population and making the earth liveable. Now, radical changes in established development patterns are needed in order to restore the natural balance of the earth's ecological system. The commitment to conserve the environment requires a rededication and collaborative action by all people in order for it to be a success. The climate change dangers ahead call for collaborated efforts putting aside social, economic and political differences, working together to enable the planet earth to sustain current and future generations. This means, those conservation practices that are proffered by religions, for example, the Jewish Sabbath principle that requires humans to give land time to recover after several years of usage must be instituted.

The world is again at a critical juncture where selfish and personal interests must be buried and focus be put on global environmental conservation for the benefit of all creation. Again bold and courageous men and women must stand on the path of destruction and call upon the world to halt the destructive mentality since humanity is invading and attacking the ecological system of which it is part of (Gore 2007:294). While some people in poor communities are still ignorant about climate change problems, some people are now conscious of the fate awaiting to befall humanity, thus, time for action to give out information and educate people has come and the environmental care must be made the central organising principle of world civilization. The world has had the warning of the dangers ahead and failing to take action now spells doom for all creation.

5.9 Moral aptitude: The climate game changer

The problems posed by climate change and variability presents huge obstacles to humanity's ability to take hard choices necessary to address it. Human attitude is at the centre of the current failure to mitigate climate change. This is caused by the fact that some of the effects of global warming take long periods of time to be fully realised, for example some areas are not affected by the sea level rise, therefore, some people are reluctant to take action not aware of other climate change problems. In light of this, people tend to defer the action needed now since they view themselves to be safe from harm. Evidently, this becomes a crisis of morals on the part of humans.

In order to effectively address the current environmental problems humanity is facing today, an urgent and collective climate change response is needed. A response that seeks to reverse unnecessary consumption and overuse of the world's natural resources. Human civilisation is getting more complex and diverse, so sprawling and massive that it has become difficult to see how humanity can respond to the global environmental crisis in a coordinated and collective way. The present circumstances are calling for one response, to conserve the natural world and if humanity cannot embrace the preservation of the earth as a new organising principle, the very survival of our civilisation is cast in doubt. The challenge humanity is faced with has to do with creating practical working relationships that bring together people who live in dramatically different circumstances. It is difficult to imagine realistic basis of hope where the environment can be saved from further damage, not only because humanity lack common agreement, but also because people have never worked together and agreed globally to team up as one. Therefore, there is need for humanity to find a way to join this common cause because the crisis humanity is facing is a global problem which can be solved on a global scale.

-Engagement with Indigenous peoples

It is time indigenous peoples are engaged in the global climate governance and policy making. Definitive global action on climate change mitigation and adaptation require meaningful involvement of local people whose indigenous knowledge base if tapped can offer lasting solutions to the global climate crisis. One of the most important tasks for policy makers who are concerned with improving the effectiveness of global governance is through enabling constructive participation of all peoples and institutions in climate governance at the global level (McLean 2012). An important aspect needed now is to broaden civil participation of indigenous communities in global governance by allowing them to make local based decisions for their communities rather than for them to be affected by decisions made by governing authorities on their behalf. Through cultural and religious motivation, indigenous peoples have mobilised and transformed their societies into groups with significant influence in setting national standards. Indigenous peoples are very effective in the implementation of climate related programmes because they can provide implementation tailored for specific conditions where they live. This view is

important especially considering the fact that the management of natural resources is best maintained by the indigenous communities whose livelihoods directly depend on those resources and thus they engage in sustainable use of resources, replenishing those resources they use for economic sustenance.

For indigenous peoples, the challenge of variable and changing climate is not a new phenomenon. These people have been the guardians of the environment for hundreds of years and they possess broad knowledge bases of the complex ecological systems in their localities (McLean 2012). Their ability to predict and interpret environmental change using traditional knowledge systems has been vital for their livelihoods and well-being and has been a strong foundation for the development of social, political and governance structures. These knowledge systems are a repository of the intergenerational knowledge that is based on observation and experimentation with nature and their close affinity to the natural world help in safeguarding natural resources.

From the findings presented in chapter four, it can be easily noted that there are different views and attitudes regarding the issues of the environment. Science and technology development, just like religion, have been blamed for causing extensive damage to the environment. Nevertheless, they have greater value in offering possible solutions and help communities cope with climate related hazards. Religions must be in the forefront of protecting the environment from human greed and exploitation, and many people must to take up the challenge and help to protect and conserve the environment. For example, in Zhombe in the Midlands Province, cutting down trees for sell as fire wood is now prohibited by the local leadership (Zuze interviewed on 14/ 05/18 at Joel Growth Point). The need to help and take part in climate mitigation programmes will remain purely open rhetoric until secular institutions, national governments and international organisations are willing to acknowledge the role of religion in environmental studies and education. Environmental education will remain incomplete until it includes cultural values, teachings and religious imperatives that require all people to be active participants in environmental protection (Dwivedi 1993:19-26).

In a Focus Group Discussion on (18/06/18), this researcher observed that some Environmental science students at the University of Zimbabwe have the fears that bringing religion into the environmental and conservation movement will jeopardise objectivity, scientific investigation, professionalism and democratic values. For them, religion has to focus on prayer and preaching and crossing the boundary to issues of environmental conservation is loss of track. However, none of these vital actors must be displaced in order to include the religious dimension into environmental protection. That dimension, if it is introduced in the processes of environmental policy planning, administration, education and law could help to create a self-consciously moral society, which will put conservation and respect for God's creation first and relegate individualism, materialism and the modern human desire to dominate nature in a subordinate way. Thus religion must have a definitive role in conservation and environmental protection.

5.10 Shared ideology

The success of the global plan to mitigate climate change lies in the willingness by all people, religions, public and private institutions to share a common vision, similar ideals and values that fosters a sense of concern for environmental conservation. The term ideology was coined during the French revolution by Antonie Destutt de Tracy (1754-1836) referring to the science of ideas (Heywood 2007:5). The term refers to the set of ideas, beliefs and principles that situate the individual within a social context and generate a sense of collective belonging. In recent years, the world has made significant and ideal choices: first, that environmental conservation be an organising principle for all nations; second, that modified free markets be the preferred forms of economic organisation; and third, that all people are now part of the truly global civilization (Heywood 2007:298). The success of these world developments was enabled by the shared vision of many nations on the need to conserve the planet. Such historical precedents of shared ideologies are important for the world today to attack with success the problems posed by global warming and thus overcome much of the impediments to progress on climate change mitigation such as the unwillingness by the industrialised nations to reduce overconsumption.

This study proposes a Global Climate Plan. This is an intervention that is critical at this moment in order to save the earth from failing to sustain life. The plan is aimed

at helping developing communities to fend off the burdens of climate related problems that are impeding development and the potential for sustainable economic growth and reduce further accumulation of greenhouse gases into the atmosphere. Developing nations need to up their production in order to meet the needs of their populations. However, with limited technological and financial strengths, African nations will find it difficult to overcome the burden of global warming. The Global Climate Plan aims at encouraging new global conservation efforts that are inclusive and do not leave out other regions of the world behind especially poor communities.

First, there must be agreement between the developed and developing nations for cheap transfer of technology to poor countries and lift them from their poor adaptive capacities. Strategic thinking and planning without consensus is useless and the lessons learnt from the Marshal Plan are instructive in that, the plan could have failed if the nations receiving assistance had not shared the same ideological views (Gore 2007:297). The same applies to the Global Climate Plan which all people must agree to cooperate. Developed nations must agree to allocate funds to transfer environmentally helpful technologies to impoverished communities and help them achieve stable populations and initiate new patterns of sustainable development.

This is not without impediments, all the efforts for cooperation requires that rich nations must make transitions themselves that will obviously be painful compared to those of developing nations because powerful established development patterns will be disrupted. In light of that, rich nations are likely to oppose these economic changes but transition must now occur or the world is doomed and it must be within the framework of global agreements that obligate all countries to act in concert (ibid). In order to be successful, these global agreements must fit into an overall design aimed at devising a more balanced way to civilization integrating developing and developed nations into the global economy.

In order to complement these efforts, the world`s supranational organisation, the United Nations must commit itself and monitor the ongoing global developments on environmental care in the same way its security council arm does on matters of war and peace in the world. Such a platform is required as the environmental crisis unfolds and the damage continue to rise. Further to that, the United Nations must

oversee all the events as they unfold because without careful balance on the obligations imposed between poor and wealthy nations, no meaningful progress will be attained (ibid). Currently, the problem that is encountered is that, there is imbalance as Gore (2007:302) argues that, “one instance is that of the implicit link between negotiations to save the rainforests mostly found in poor countries and the negotiations seeking to reduce greenhouse gas emissions which is proving to be a difficult move in wealthy nations”. As such, the negotiations of the Global Climate Plan must prioritise and value environmental care over selfish human demands and the most important and critical issue is for humanity to ethically treat the environment with a sense of stewardship to all creation.

The design of the Global Climate Plan must also take into consideration the fact that countries are at different stages of development with developing nations trying to catch up with the developed world. Therefore, there is need for sensitivity on political, cultural and economic development of all nations (ibid). United States of America President Donald Trump’s decision to pull out of the Paris agreement on the first of June 2017, was a huge obstacle facing the efforts to halt global warming especially considering America’s financial muscle and high levels of carbon dioxide emissions. The major reason for these huddles is that weaning the world off the fossil fuels that have driven economic growth has proved to be harder than anticipated (Worland Justin 2017). However, failure to take definitive action now, the planet earth will experience the worst irreversible effects of climate change with extreme heat waves making the planet unliveable and also disrupting agricultural production causing widespread food shortages.

5.11 Mitigation strategies to avert climate change

As has been indicated in chapter 1, human actions are behind the global warming crisis the world is facing today. As such, humanity must act holistically to deal with climate change inclusive of the often overlooked religious contributions. For the Shona people, the entire relationship between humans and the environment with regards to land use, forest and wildlife conservation has deep religious and spiritual underpinnings that has sustained environmentally friendly attitudes. Religion is central in almost all decisions that Shona people make in their daily lives. Climate change mitigation and religion must be discussed in the context of sustainable

development practice because some of the drawbacks in mitigating climate change especially in Africa and the rest of developing countries points directly to the relegation of religious Cosmo vision. Therefore, there is need to take into consideration new epistemologies, concepts and those models that recognises religious institutions in order to succeed in reducing the burdens posed by climate changes.

Humanity must begin to find a new eco-centric course of action in order to save the environment for the benefit of the present and generations to come. The world's efforts to save the earth from further damage must be organised around action pillars that simultaneously represent the most important changes. Each goal to protect the environment must be supported by a set of moral principles that enables world civilization to timeously prevent environmental catastrophic and irreversible damage. In religious gatherings, it is now important to include birth control measures as part of the order of services to try and reduce overpopulation. This is a strategic goal that is aimed at stabilising the world population.

High population means high demands for food, jobs, farm land among many social amenities resulting in the earth's carrying capacity being disturbed. The major effect of overpopulation resulted in the unequal and unrestrained use of natural resources exhausting planet earth has a limited capacity to regenerate itself. When consumption of natural resources is faster than its ability to replenish itself, resource depletion occurs. As people scramble for scarce resources, territorial conflicts erupt especially in developing countries, people seeking to control natural resource bases.

With the current human population standing at around 7.6 billion as per the 2018 United Nations estimates, the most important and crucial move that is aimed at attaining definitive global environmental protection is the stabilization of the human population. The sudden population explosion in the world since the scientific revolution is one clear example of the dramatic change in the overall relationship between the human species and the earth's ecological system (Gore 2007;269). The speed at which the population grew is itself the major cause of ecological disruption since human societies have learnt to eke out a living from the fragile ecosystems which all of a sudden have been confronted with the need to feed, clothe and provide

shelter for the vast number of people within those same ecosystems. The problem at hand is that the world's natural resource base continues to fall as the population grows, thus exerting more pressure on planet earth than it is able to sustain (ibid). Developing countries continue to realise population bursts when poverty and environmental degradation are already severely affecting those communities. The ways through which these people live and use natural resources and the technological tools used to extract natural resources from the earth have damaging impacts on the environment.

Further to that, placing contraceptives like condoms at all public places for easy access by the people has not been effective in Ward 19 in Karoi district Mashonaland West Province. The survey that this researcher conducted in Hurungwe on 22/06/18 at Murambi Clinic showed that condoms are readily available at public places and clinics. However, the majority of them are being taken by young boys to make plastic balls. The elastic rubber at the opening of the condom is used by many school going boys to tie their stockings. There is misrepresentation of facts especially by health officials assuming that condoms are being used yet they are misused. What must be done is to take the education drive to the churches, schools farms and remote poor areas where high birth rate is rampant. At one time this researcher conducted a lecture on consistent and effective condom use after Sunday worship on 24 June 2018 at one Christian gathering in rural Mashonaland West province after consultation with church leadership. Even though the congregants did not want their identity to be publicised, some participants cooperated very well. However, a report was written to the church elders after the event castigating it with harsh words. Education through seminars must be done to help ease the situation and help people to accept the reality and efficiency of contraceptives.

Agreement has not been reached among many in developing and poor countries that the global environment is threatened principally by the huge world population. These people see only the immediate benefits of having many children in the form of help they get in working on a farm and other activities at home and never thinking about the future. Once one receives a piece of land to live on and grow crops to feed a family, all is well. With many people to allocate land to, vast forest lands are

destroyed. The figure below shows the effects of a huge population on forested areas. In a few years, the entire forest will be destroyed completely.

Figure 5.3 A once densely forested area slowly giving in to farming in Mashonaland East province.

Photograph taken by this researcher.

The major cause of such high levels of deforestation is population growth because the modern ways people use in development and manufacturing are critical in determining the environmental impacts. Kraal Head Maheyi of Ward 27 in Hurungwe intimated to this researcher that pieces of land owned by families is no-longer enough for children born in those families. As a result, local leaders are moving into game reserves to allocate people land deep into the Zambezi valley. Africa and the rest of developing countries as shown in figure 5.4 below are already putting great pressure on their natural resources and threatening the resilience of the natural ecosystems. So to imagine the continued population rise is devastating and casts a shadow of doubt if future generations will be able to survive on planet earth. Already the quality of life that most people in less developed countries are leading leaves a lot to be desired. Women are already walking long distances to get fresh water, food and fire wood for energy. Many children are no-longer going to school in order to assist parents in gathering food and other house hold chores. Despite all these hardships faced by less developed communities, child bearing is at its highest level, an indication that action must be taken now.

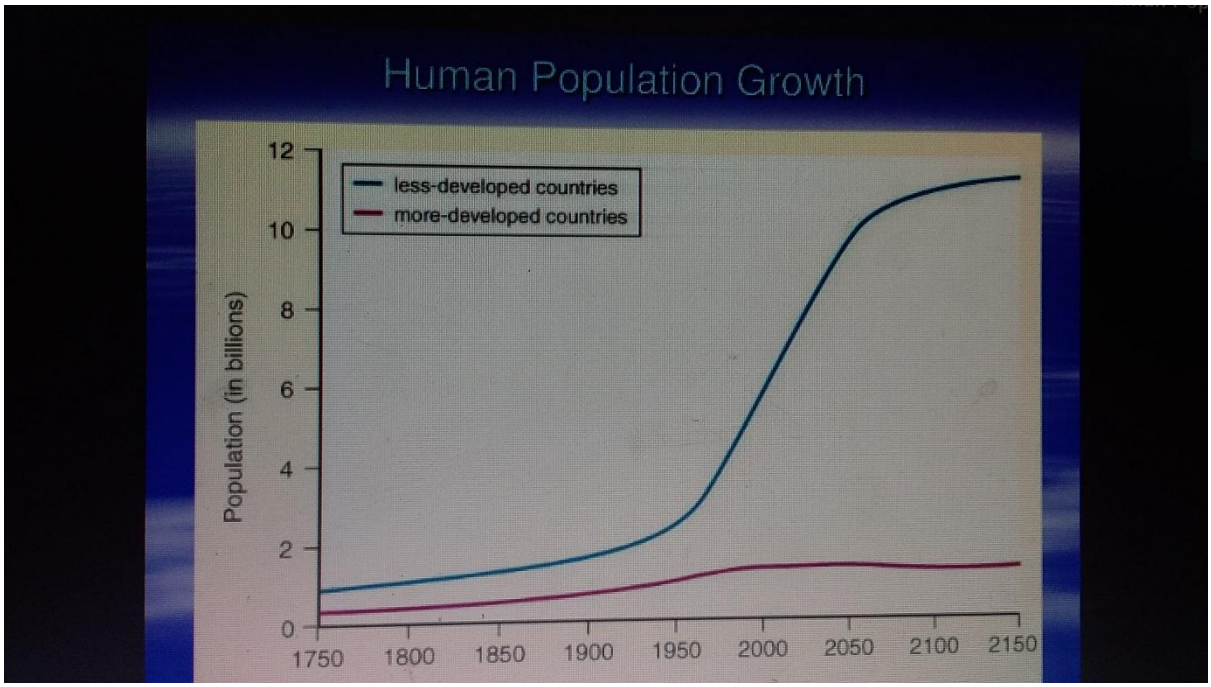


Figure 5.4 Population growth pattern between developed and poor countries.

Source: Population Reference Bureau.

Less developed countries have a higher population compared to more developed countries. Factors like education and women empowerment played a pivotal role in maintaining stable population in developed nations. Further to that, the Zero Population Growth (ZPG), that is a demographic balance in the number of people born and those who die was well received in developed nations together with advanced technologies which eliminated a lot of diseases and epidemics. In Africa for example, it remains difficult to limit the number of births to two per woman. The reason behind such negative responses is that, health care facilities are still poor and the mortality rate is very high. Furthermore, the need to have more male children is causing population to burst. According to elder Gotami (interviewed 15/06/18 in Karoi), if someone dies without male children, that person is not accepted in the world of ancestors. That person's spirit languishes as an alien spirit without rest. This belief is held by many in Africa and one ends up with a dozen children and the ZPG becomes a façade.

A people friendly approach is sufficient to arouse the interests and cooperation of poor people to action towards stabilising human population. An approach that is commensurate with values, customs and aspirations of the poor. The most important thing is for local people to be actively involved in a Direct Participant Approach (DPA) than a parochial setup. In Direct Participant Approach, citizens actively engage with leaders and they are aware of the need for them to make inputs in the governing process and the kind of outputs to expect from leaders. In a Parochial setup, people are not concerned with what is done by leaders and have no knowledge of what is happening. Direct involvement of local people is the way to go.

Voluntary Birth Limit (VBL) is proposed in this study specifically for less developed countries whose population graph is higher than that of more developed countries as indicated in the figure above. The significance and morale of the VBL is rooted in the individual`s motivation to make the earth liveable for all generations. An area of critical contestation arises whereby those people with female children will keep trying until a male child is born. This comes on the background of strong Shona cultural beliefs that every family must have a male child. If a man dies without a male child, that man is not accepted in the realm of ancestors and his spirit will never find rest (Shoko interviewed on 24/06/18 in Karoi). This situation presents a massive challenge to population control measures among the Shona people. This researcher had a conversation in Murewa District in Mashonaland East Province with a village Mid-wife *Nyamukuta*, who preferred to be called *Gogo* that is translated grandmother on 24 June 2018 who acknowledged that in her area the population is high and some of the contributing factors is the issue of having male children. She however pointed out that with traditional medicine she is able to help women conceive male children through a process called *kusandura nyoka*, that is to manipulate the womb to procreate another sex, and even indicated having helped about 18 women one whom this researcher met on the same day and confirmed her joy after having tried for several times to get a male child who eventually came sixth. This is an area that need further research and exploration.

Active involvement of local people in global governance is critical at this moment and time because local communities are effective from an operational context to influence population control outcomes because their actions are tailored to suit their

contexts. The problems that are faced by policy makers are that, they ignore local platforms and institutions that are fundamental in addressing global environmental challenges. As has been noted earlier on, Shona religion continues to influence the lives of African peoples including the highly educated people. This religion has endured the tests of time, modernity and globalisation retaining its identity. Its resilience is deeply embedded in the indigenous knowledge systems, social networks, attitudes and cultural values. Constraining, restricting and undermining indigenous peoples' values and norms by policy makers has led to poor responses in embracing population control measures (Macheka Interview 24/06/18 in Karoi).

Religious environmental concerns had not been directed to population stabilization, something that must be initiated. Many religions seek to increase the number of their members through evangelization and those born into their religions. Checks and balances need to be considered especially on membership growth through birth into the religion through encouraging religious adherents to regard the well-being of the earth with a true sense of stewardship. With the number of people professing faith to different religions, the task of attaining a stable population is easy.

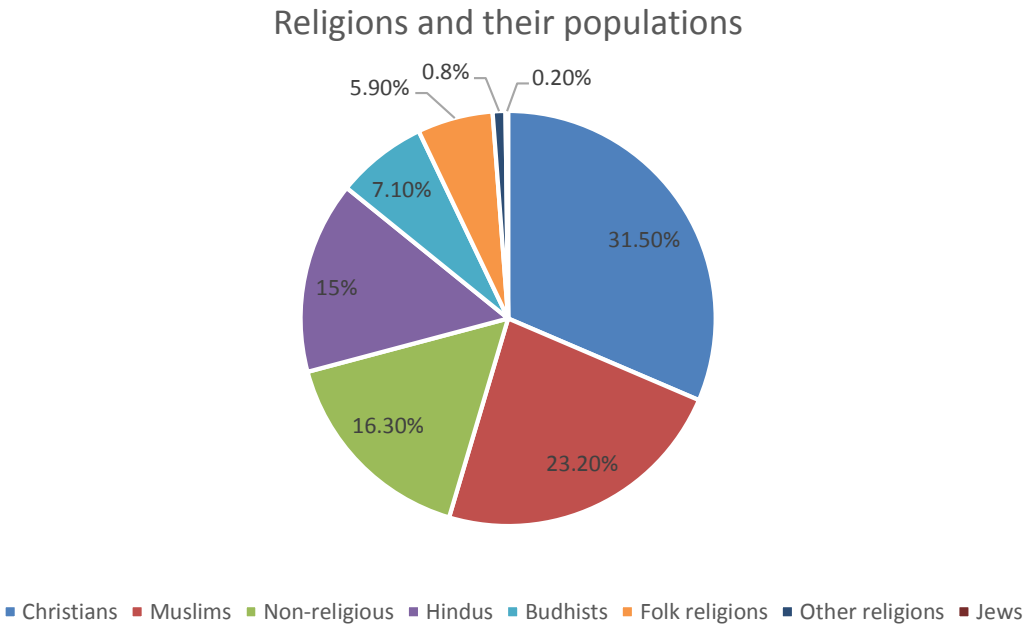


Figure 5.5 Percentage numbers of population per religion in the world.

Source: Population Reference Bureau

Religious involvement in Voluntary Birth Limit is of paramount importance if the world is to achieve stable population equilibrium. In chapters 3 and 4 it was noted that religions of the world have practices and teachings that are environmentally friendly, but those teachings are easily outpaced by the growing population which directly exert more pressure on the environment. Religious environmental consciousness is key in encouraging religions of the world to discourage excessive births per woman thus maintaining a stable population in the long run.

-Human moral responsibilities

Industrialised nations leap-frogged their development through the use of fossil fuels. Development increased tremendously from the mid-1700 as the industrial revolution was powered chiefly by high carbon emitting fossil fuels changing the way of life for Western societies by generating enormous growth in production of goods. These fuels produced more carbon dioxide which disturbed the natural variation of the earth's climate system. For long periods of time, the carbon cycle has maintained an equilibrium between carbon dioxide in the atmosphere and the carbon dioxide dissolved in Oceans and part of it being absorbed by plants for photosynthesis. This equilibrium is now under threat. The amounts of carbon released into the atmosphere has begun to outstrip the amount of carbon dioxide absorbed by plants and Oceans since the global oil consumption skyrocketed from 149 million barrels in 1890 to above 20 billion barrels by 1988 (Fisher 1990:141).

In light of this, measures to mitigate carbon dioxide induced climate change must be categorised into three categories: the first one being the need to take definitive measures against corruption which has been institutionalised especially in developing countries. According to the Corruption Perceptions Index report by Transparency International (2017), Zimbabwe for example averaged 24.95 point from 1998 to 2017. Secondly, governments should agree on conserving and using alternative energy resources that do not produce more carbon dioxide. Finally, there is need to adopt mitigation solutions to collect and sequester carbon dioxide emissions and increase biomass including reforesting all denuded areas in the world. For this exercise to yield definitive results, this study recommends that such measures must be taken from a worldwide perspective since the problem is a global

one and action by one or two countries alone will have little influence on reducing the build-up on carbon dioxide in the atmosphere. Further to that, humanity must come to a common agreement and attack this moral problem collectively for the benefit of all creation. This can be achieved through invoking religious teachings that inform human conduct. Most traditional religions in Africa have beliefs and practices that stand as prime sources of guidance and support. Shona people are cultured moral beings with great concern for harmony with the natural world, hence their involvement is important.

Sustainable development cannot be realised by African people and other vulnerable communities unless it reflects the cosmology and beliefs of the local people. Existing plans to curb climate change have ignored essential religious beliefs that are foundational to the people's welfare. For example, the Shona people's connection to their land has been affected by massive agricultural expansion destroying sacred lands. As a result, the Shona people's participation in conservation diminished. Shona religion inspires its adherents as expressed in the way in which they regulate their relationship with environment and fellow human beings. In this respect, some animals, forests, rivers and hills are considered sacred and this belief has helped to maintain the natural balance in the environment.

Taking care of the environment has never been something new to the Shona people. The motivation behind human-nature relationship has religious and spiritual roots that are respected by the people. The religion has a symbiotic relationship with the rest of the world, a key factor in influencing people to care for the environment. It generates self confidence among the people and denounces exploitation and domination of other beings. The way Shona people relate to land, a resource upon which all developments are done cannot be ignored. Unless the efforts to address climate change are articulated by the intended beneficiaries, it will not be able to inspire confidence on local people to act.

-Uprooting corruption

Corruption, greed and the insatiable appetite for wealth has resulted in massive loss of bio-diversity and disruption of life support systems. Hunger, poverty and diseases continue to destroy many poor societies albeit in a world of plenty, for example,

diamonds were looted in Chiadzwa without the national treasury getting anything (Chitemba 11/02/18). In the year 2000, 191 nations proposed the Millennium Development Goals and sought among many things to halve the number of those living in extreme poverty by 2015. However, the gap between the rich and the poor is growing despite global efforts and they have terrible effects on the economic, political and social standing of society. Fair political and economic systems are achievable if state actors are willing to forgo consumptionist ways of life that are rampant in bribery and looting. The ever rising trend of economic inequality is standing in the path of sustainability and global environmental conservation because around two billion people are hard hit by malnutrition, illiteracy, disease, short life expectancy and a higher rate of infant mortality (World Bank report in, Young 1997:293). African dictatorships go beyond not only acquiring more wealth but also purchasing weapons in order to maintain their grip in power. Extreme cases of economic inequality have corrupted the entire world making it difficult to realise the Millennium Development Goals.

The argument that religion plays a central role in shaping the economic life of the world has widespread acceptance in this research. Basically all religions of the world teach much on the importance and necessity of hard work. For example, in Theravada Buddhism, craving must be overcome in favour of self-sufficiency. Christianity accepts the development of free enterprise economies that rely on individual initiatives at the same time expressing deep concern for the poor who cannot provide for themselves (World Bank report in Young 1997:294). It is important for humanity to revise her moral standing and avoid that which destroys the social fabric of society and build a corruption free society.

-Action to move to renewable energy sources

Since the beginning of the twenty-first century, it is evident to many people that the balance of life on planet earth is in mortal danger. Humanity had lost the stewardship responsibility bestowed upon her by the Creator, and instead of taking care of creation, humanity exploited and continues to ruin the natural world. Exercising responsibility is the reason why humanity was created and human stewardship is foundational to human existence since humans are called to preserve because in

Genesis 2:5-15, man and woman are put in the garden to till and keep the land. However, nowadays humanity had become so corrupted to the extent that taking care of the land was substituted by exploitation. The critical issues at stake are as follows:

- carbon dioxide emissions leading to ozone depletion
- deforestation and desertification
- pollution of the air, earth and water
- population growth
- extinction of animal species
- overconsumption of natural resources and
- the proliferation of nuclear weapons.

For many decades, several schools of thought have argued that the very roots of the modern environmental crisis are found in religious teachings of the West especially Christianity which taught that humans are distinct from nature and have a divinely sanctioned right to exploit nature (White 1969:42-47). Since the roots of the present environmental crisis are a result of eroded moral and spiritual well-being of humanity, the solutions must come from religious sources as well. It is now crystal clear that any analysis of the ecological crisis must include attention to the possible role religions have played in creating the problem and their potential for solving the problem.

According to the report by the National Research Committee on Nuclear and Alternative Energy Systems, environmental conservation deserves the highest immediate priority in energy planning and production (Kellogg and Schware 1981:117). The issue of immediate action to conserve the environment has been reiterated in several studies of economic and environmental risks in the world`s energy future. In addition to conservation, it is high time the world prepares itself to move away from fossil fuels and take soft energy paths that can minimise carbon dioxide emissions in the future without delay. These soft energy paths combine

conservation measures with the use of renewable energy sources such as solar, wind and geothermal power that are locally controlled and available locally. Furthermore, these conservation measures will make cheaper energy available in future, increase goods and services produced per unit of energy used and thus minimise fossil fuel combustion thereby reducing the emission of carbon dioxide into the atmosphere (Kellogg and Schware 1981:117).

The so-called hard energy paths such as fission and fusion will serve as long term energy sources in developed and developing countries. The choice of nuclear technologies has a clear advantage over fossil fuels in as much as carbon dioxide emissions are concerned since they emit little carbon dioxide into the atmosphere. However, the hard path of nuclear power may at least in the short term be an acceptable one but the public is becoming suspicious of the health and environmental risks involved in handling and disposing it and the uncertainties about the availability of Uranium in the world leaving the world with no option but to ban nuclear energy.

The critical point here is that reducing energy demands which many people are advocating will reduce both the burning of fossil fuels and reliance on nuclear energy which is difficult to dispose of. These two are good reasons for justifying energy conservation as the cornerstone of the energy policies in developed countries that are regarded as the major polluters of the atmosphere and are responsible for the past and present carbon dioxide emissions (Kellogg and Schware 1981:118). Therefore, to significantly reduce global emission of carbon dioxide, these measures have to be adopted by all major users of fossil fuels in the world and those countries that are on their way to industrialisation regardless of the amount of carbon dioxide emission different countries may have.

-Sustainable waste management

Sustainable waste management refers to the integrated planning, implementation, monitoring and review of waste management measures to ensure sustainability and to prevent hazardous impacts on human health and on the environment (Strydom and King 2009:707). Managing wastes that are produced from burning fossil fuels has proved to be a difficult task in the world. The best solution is to reduce the use of

fossil fuels whose waste matter is difficult to manage. In times of crisis, terrible environmental disasters happen. For example, in 1991, a coalition of European countries including France and Germany, America, some Arab nations including Qatar and Singapore and some Africa countries including Egypt and Senegal waged war against Iraq for invading Kuwait with the approval of the United Nations (Jacobs 2003:17). Iraq troops burned Kuwait oil wells and dumped 1.75 billion litres of Kuwait crude oil into the Persian Gulf killing wildlife and causing long term harm to the environment (Jacobs 2003:19).

Sustainability is achieved by reducing the amount of wastes and protecting the environment through pollution control measures. Waste management must start with the prevention of the initial production of waste and entails minimising the amount of waste produced and managing the disposal and discharge of all residue waste (Strydom and King 2009:708). Waste matter usually represents the unused part of non-renewable resources or the contaminated part of renewable resources, therefore the focus for sustainable waste management should be to reduce the generation of it (ibid). Successful waste management aims at reducing the amount of waste produced and making the best possible use of waste that is produced and implementing measures that lessen the possible harm before, during and after the waste is deposed of. Manufacturers must take into consideration strategies for recovery, reuse, and recycling of waste matter and technologies for clean waste energy must be implemented as part of waste minimization programmes. If waste is generated in large quantities without control, it becomes very difficult to prevent potentially hazardous matter from polluting the environment.

High levels of energy demands and over consumption in industrial countries, deforestation in developing countries are the driving forces behind the decline in virtually all major life support systems on planet earth (Gupta 2001:201). There is urgent need for radical resource efficiency and eliminating rather than managing waste matter, strategies that have major benefits for slowing climate change (ibid). Zero waste must be prioritised. This is a goal of how humanity must responsibly manage materials and the energy that is required in manufacturing. It is a whole system to resource management that maximises recycling and minimising wastes, reducing consumption and ensuring that products are made to be reused, recycled,

and repaired back into the market. Saving energy by using recycled materials uses less energy compared to manufacturing using virgin materials. By recycling paper, more trees are saved so that they absorb carbon dioxide thereby reducing the amount of carbon dioxide accumulation into the atmosphere (ibid).

Humanity the world over has been disposing waste matter in dump sites in areas outside cities and towns and then burn the garbage causing massive air pollution. These dump sites come with their problems especially that of harbouring diseases carrying organisms like rats and flies and they produce foul odour generated by decomposing garbage. Landfills are also used as waste disposal methods in developing countries. Below is a graph showing dangers posed by landfills.

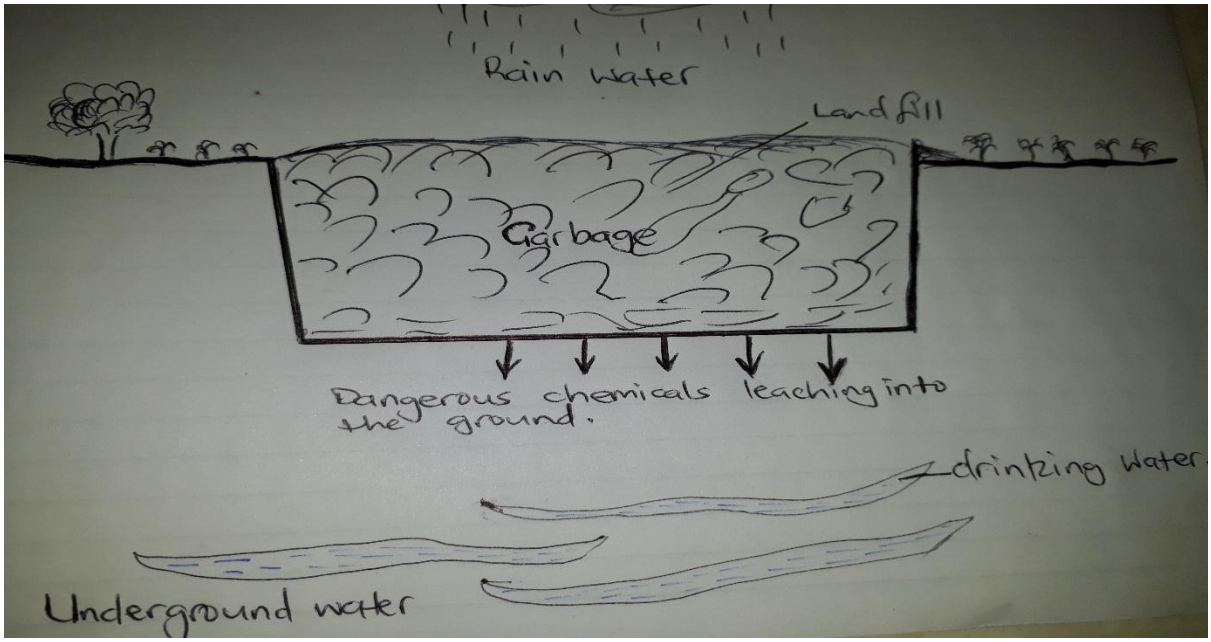


Figure 5.6 Dangerous chemicals leaching into the ground.

Diagram drawn by this researcher.

In a landfill, all waste materials are dumped causing extensive pollution of ground water, soil and air. Even house hold trash contains dangerous chemicals and metals that leach out of the landfills as shown in the figure above. In this process, rain water and water that is trapped in food wastes filters through the landfill dissolving chemicals and carrying them deep underground where they contaminate water. Leaching of dangerous chemicals is worrisome because ground water provides the bulk of safe drinking water. So to avoid the consequences of contaminating ground

water, recycling must be done. This is a process that involves separating trash items according to the substances of which they are made for example aluminium, paper or glass and are then sent to companies that recover valuable materials from them which eventually are made into useful products (Rallof 1990:58).

-Conserving energy and increasing resource efficiency

The goal of resource efficiency relates to maximising economic returns on natural resource use and achieve the best possible net benefit and thus fulfilling the goal of economic development (Strydom and King 2009:38). Equitable distribution of resources is important in ensuring that all the basic needs of the population are met at the same time ensuring an acceptable and health state of natural resources for both the present and future generations.

A low energy future would mean that carbon dioxide induced environmental impacts and climate change could be largely avoided if energy conservation paths are adopted. There should be very strong incentives to conserve, including reducing dependence on fossil fuels and protecting the environment from further damage from carbon dioxide emissions. Conservation is one of the soft energy paths that can result in more renewable energy resources. However, in order to achieve significant reduction in carbon dioxide emissions in the world, this strategy should be adopted by all countries of the world and should cut across political and even economic establishments. With all these plans at hand, the lack moral motivation has led to failed policies. In light of this, religion therefore comes in to fill in the moral gap since in its teachings religion upholds moral uprightness for all its adherents.

Developing countries' industries are all powered by fossil fuels, a situation that is set to continue if no action is taken now to migrate to renewable energy sources. Zimbabwe for example consumes about 44.6% of energy from coal annually, 12.4% from petroleum, 4.8% from hydro-electric power for rural households. Biomass contributes 39.4% to the total energy supply base annually (Zhakata 2004:2). It is clear that the country's energy consumption patterns are carbon intensive therefore mitigation options buttressed by the formulation of a natural and institutional framework for definitive mitigation efforts is imperative and must be actioned now to save the environment.

The use of renewable energy resources available is one of the best strategies to reduce carbon dioxide emissions into the atmosphere and the best way to manage and conserve the environment. These renewable energy sources include wood and other bio-mass substances, garbage, wind and solar energy which include direct capture of sunlight, hydroelectric power and ocean thermal sources all of which are readily available naturally and in plentiful proportions (ibid). These resources have trade-offs related to each of these energy forms since some are less risky and are less polluting than other energy sources like coal and gas while some produce more net energy for a given capital investment.

There are several mitigation solutions that have been proposed for managing carbon dioxide that is produced by burning fossil fuels. All these solutions seek to control the atmospheric concentration of carbon dioxide there-by averting the possible climatic impacts and consequences. Ultimately the success of these methods is linked to the world energy policies, forest management and personal societal values (Kellogg and Schware 1981:117). Kellogg and Schware (ibid) argue that most of the economical solutions would be to control carbon dioxide emissions at their source and to do this effectively, efforts would have to be concentrated on the large fossil fuel producing or consuming facilities. It is estimated that about eighty percent of coal and virtually all oil passes through some centralised processing facilities such as refineries and power plants before being burned (Marchetti: 1997:299). As a result, there is easy access to the carbon dioxide produced in these industrial plants and steps should be taken to control it right at the source.

Progress can be realised by increasing investment in energy efficiency and also by strengthening the development of local markets and supply chains to cut on the wasteful and unnecessary shipping or transportation of goods and materials over long distances. However, the key to the success of these initiatives lie in the positive mind-set and responsible actions by human beings towards the environment. In this regard, religions play a pivotal role influencing people to positive action. At the centre of climate mitigation and adaptation lies human attitudes without which it is difficult to cope with its impact. Energy wasting can be reduced by cutting excessive and unnecessary consumption, requiring consumers to change their attitudes and

behaviours to become more mindful of energy and environmental impacts of their energy choices.

To realise the full potential of energy efficiency, religions must be actively involved since religious adherents also take part in energy consumption. Gone are the days when sermons are modelled on spiritual issues alone, there is need to accommodate climate change information in sermons and religious gatherings. This is very important especially considering the findings in chapter 4 indicating that quite a number of Christians interviewed professed ignorance of climate change. If technical solutions and information does not reach out to all vulnerable societies and remote areas, their coping with climate change is jeopardised.

Further to that, energy efficiency can be improved through a wider application of available technologies, innovation of new technology, improved material efficiency and increased recycling and substitution of energy intensive goods that require and consume more energy on the side of producers and policy makers. Effective energy policies must support effective price signals, entrepreneurship and changes in behaviours of the consumers in order to be able to drive the development and deployment of efficient technologies. New industrial processes and motor systems should be designed and modelled to substantially and sustainably reduce high energy demands. The world has made some strides in terms of technological advance but missed the mark on the participation of all people since climate change is a global issue needing global attention because even those with least greenhouse gas emissions are more affected.

In homes, energy use can be cut using combined heat and power systems, more efficient lighting, cooking, cooling, heating, use of better insulation and much use of passive solar and solar water heaters. Initial costs for more efficient technologies are often higher but the overall life cycle costs are typically lower because of energy savings enjoyed. Gains in efficiency will reduce energy intensity and greenhouse gas emissions but most importantly, they also reduce the amount of capital required for investment in new energy supply systems (Smith 2006:37).

-Engaging Traditional and Religious leaders in environmental monitoring

This is one of the strategies that can lead to improved and sustainable practices that takes into account the services of traditional and religious leaders who are on the ground where people are. It has been noted in this research that traditional leaders wield considerable influence on people they lead as custodians of the land. Acquisition of climate change data and global monitoring of the environment are vital components in efforts to mitigate global warming and climate change that must be made accessible to all people even remote poor communities. Thus people are able to keep track of the environment and be able to take all the necessary steps to ensure a carbon free environment. In Zimbabwe institutions like Environmental Management Agency should step up their functions and cut down the environmentally unfriendly practices in all parts of the country. Alongside the Forestry Commission, monitoring of the environment should be made government policy and requiring stiff penalties thus helping in protecting and conserving the environment.

There is also need to provide and apply more improved climate change data to all vulnerable communities. Of late, climate change data has been gathered at many stations throughout the world but only a small part of it was made available in readily usable forms notably in developing countries (Kellogg and Schware 1981:118). Such programs would improve the availability and application of climate data for planning and operations in many countries that lack the expertise needed to use knowledge of climate and its influence on human activities towards the environment. While the immediate thrust of all these efforts are to cope with short term climate variability, they will also help people prepare for long term climate change impacts. Provision of public information and education are also very important tools for sustainable development. Disseminating the results of carbon dioxide emissions and climate change studies to reporters, environmentalists and other interested groups will raise the general level of public awareness about the problem of climate change to all people. Such information will encourage the development and designing of new products and facilities that could respond to new climatic conditions as well as to climatic variations like drought resistant crop varieties. Further to that, long term

measures for coping with climate change will be more readily accepted if a well-informed public understands the reasons for their adoption.

The other very important factor and coping mechanism is the transfer of appropriate technology to developing countries. Immediate investment in Applied Climatology and weather prediction techniques is highly desirable for most developing countries which are far behind hence the lack of adaptive capacities. Such investments will fulfil the people`s needs in areas such as clean water supply, plant husbandry, animal husbandry, energy resources and land use planning (Kellogg and Schware 1981:118). The benefits are likely to outweigh the costs since the entire world will be geared to harness techniques that are meant to save the environment for posterity. As such technological transfer should be encouraged in a number of areas such as renewable energy resources and Agro-technology so that heavy dependence on fossil fuels is cut down.

-Reforesting

There is growing dependence on wood for energy and for construction purposes and the trend is much higher in third world countries where the population is ever growing. More than half of the mass of the entire biosphere is in tropical forests in the world. Of major concern is the fact that these forests are being reduced by as much as one percent per year due to the high demand for timber to cater for the insatiable human appetite to accumulate more wealth without taking measures to correct the wrongs done to the environment. Such widespread deforestation has ruined and destroyed valuable economic asserts that would have benefited future generations.

In Zimbabwe the removal of forest cover has degraded the soil and caused severe erosion of arable and grazing land in most parts of the country. A re-growth of trees prevents erosion and take up atmospheric carbon dioxide and converts it to plant tissue through a process called photosynthesis. Thus in fact reforestation is not only a strategy that makes sense in economic terms, but it also provides a sink for the carbon dioxide being released into the atmosphere at the same time conserving soil.

Instead of disposing of carbon dioxide in ways that require much capital, there are cheap ways to expand the natural sinks that can absorb it without polluting the atmosphere. An increase of just one percent in the plant life on Earth especially the forests is sufficient to absorb one year's release of carbon dioxide at the current rate of global emission (Kellogg and Schware 1981:121). If the carbon dioxide emission continues to rise or the more fossil fuel industries use, the less efficient bio-mass sink becomes. Only if the two criteria are met can expanding the world's bio-mass help control atmospheric carbon dioxide levels to the 1990 levels that were not so harmful to the environment. Firstly, sufficient resources like land, water, nutrients, manpower and capital must be made available to encourage the growth of vegetation and religions, with their numbers, can bring about positive results. Secondly, disposal methods must be found that will sequester fixed organic carbon for long periods and this delays the accumulation of carbon dioxide in the atmosphere. The ecological implications of reforestation schemes must not be overlooked. Any additional climatic consequences may result since changed vegetation patterns could affect the intended cooling effect by absorbing more solar radiation and thus warming the earth.

-Investing in human resource capacity

The efforts to offset the greenhouse gas emissions can only amount to a stop gap measure that will help to make near-term progress in reducing emissions (Kellogg and Schware 1981:123). A definitive and low carbon revolution requires a combination of technologies, harnessing the portfolio of energy resources and human resources together. To capitalise on the human potential to cope with climate change, learning systems that will enable humans to perform conservation duties must now be taken out to religious institutions as well as those communities that are vulnerable to ensure that there is quality human resource that is able to perform. According to Huff (2014), human resources are to be natured in order to arrive at a mutual commitment where tangible investments by any organisation are favoured and then reciprocated by its members with high levels of performance.

Religions presents a huge base of human resource. As has been noted in chapter 3, religions constitute a huge population whose motivation stems from the religious

authorities in those different religions. For example, Zimbabwe is inhabited by people of Bantu origins the majority of whom are Shona speaking people and the minority are Ndebele speaking people. These people are deeply religious and they follow their cultural and traditional teachings with reverence but they lack information (Jiri interviewed on 20/06/18 in Guruve). As such, equipping these people with necessary knowledge and skills will improve their climate coping mechanisms. The success of this initiative rests on engaging churches and all religious institutions making sure that every religious gathering teaches on environmental conservation to its adherents.

Technologies that have the potential to play a significant and meaningful role in the shift towards a low carbon economy include:

- Renewable energy resources, solar, wind
- Coal gasification with high carbon capture
- Hydrogen based energy.

Renewable energy resources bring with them many advantages for sustainability. They have low or zero greenhouse gas emissions and are very cheap. They can cut fossil fuel demand and increase energy security by reducing dependence on imported fuels especially in developing countries. Technologies such as small scale hydropower, wind, solar and bio-mass are well suited for the small scale off the grid electricity generation and therefore are appropriate for delivering energy to remote rural areas in developing countries. Therefore, dependence on wood for energy will be minimised in rural communities. However, all these technologies have no effect on poor communities who do not have knowledge and skills. That is why this research recommends that information must be taken to religious institutions.

-Protection of arable lands and wetlands

Vast uncertainties inherent in the carbon dioxide problem are often cited as justification for taking no action now. Dealing with the carbon dioxide and or climate change problem is one way of coping with climate change and variability. Thus there are strong incentives to reduce vulnerability of human settlements and activities to

both climatic variability and change. The loss of arable soil through erosion or salinization of soil and poor agricultural practices have been responsible for the decline of entire civilisations in the past to produce good yields and feed a huge population. Currently much land globally is being lost to agriculture due to poor management practices. To maintain and increase world food production that will sustain the world's population, the soil must be protected through sustainable agricultural practices. This must be done especially in marginal, semi-arid lands where overgrazing and poor agricultural practices have led to desertification and this process is accelerated most during the periods of droughts.

Since the agricultural revolution, humanity tilled the land to produce food. Tillage is a mechanical way of land preparation whereby soil agitation is done killing weeds, soil organisms and important microbes and soil erosion is very high. This method of farming has resulted in the soil being worn out.

Figure 5.7 Mechanical land preparation

Source: https://geneticliteracyproject.org/2016.

Land preparation through tillage damages the soil and leaves it highly exposed to erosion. The figure above is typical of the modern day methods of preparing land for agriculture. This method has proved to be effective in the production of sufficient food to feed huge populations but is dangerous to the environment since it completely destroys soil organisms, organic matter and chemicals that are used are

harmful to the land and water bodies. And it is not sustainable for humanity to continue to employ such farming methods that do harm to the environment.

The Shona people used a No-till farming method and this way they preserved the soil (Gombo interview 16/06/18 in Guruve). Arguably, this method was used since the indigenous peoples had no equipment to till the land but a lot is learnt on how this way of farming did little harm to the soil. Zero tillage is a conservation method of growing crops without disturbing the soil through tilling. This method increases the amount of water that sinks into the soil and it increases organic matter retention. In many agricultural regions, it reduces or eliminates soil erosion. The most important benefit of zero tillage is improvement in the soil`s biological fertility thus making the soil more resilient. It is the central element of what is nowadays referred to as Conservation Agriculture which brings agriculture into harmony with nature by reducing soil erosion by up to 90 percent (www.fao.org).

Conservation Agriculture is a way of managing agro-ecosystems for improved and sustained productivity, increased profits and food security at the same time preserving and enhancing the resource base and the environment (www.fao.org). This method is important as it ensures continuous minimum mechanical soil disturbance, permanent organic soil cover and diversification of crop species grown in sequences. Conservation Agriculture is a method that is applicable to all agricultural landscapes and land uses with locally adapted practices that enhances biodiversity and natural biological processes above and below the ground surface. There is great soil conservation because mechanical soil disturbance is reduced to an absolute minimum level through optimal application of inputs such as agrochemicals and plant nutrients of mineral or organic origin in ways and quantities that do not interfere with, or disrupt, the biological processes (www.fao.org).

Further to that, conservation agriculture facilitates good agronomy practices including timely operations, improving land husbandry for both rain-fed and irrigated crop production. Complimented by other scientific methods of production such as using quality tested seeds, integrated pest control, nutrients application, weeds and water management, conservation agriculture is a base for sustainable agricultural production intensification. With conservation agriculture, there is increased

integration of production sectors such as crop-livestock integration and integration of trees and pastures into agricultural landscapes (ibid). Soil erosion that come as a result of soil tillage has become the valid reason for humanity to take action and reverse the process of soil agitation and degradation and the only viable move is to reduce tillage. Untilled soil allows plant residue to accumulate on the soil surface thus increasing mulch which improves soil fertility without even applying artificial nutrients (ibid). More so, the mulch protects the soil from the physical impact of rain and wind and stabilising soil moisture and temperatures on the surface. Thus this zone becomes a suitable habitat for organisms, fungi and bacteria which macerate mulch decomposing plant matter into humus.

-Water harvesting and conservation

The other way to mitigate climate change for poor and vulnerable communities is to ensure adequate water supply for both consumption and domestic use. Many vulnerable communities live in dry lands where women and children are the most affected having to walk long distances to fetch water. Sand dams is the best solution that ensures adequate supply of water. Sand dams are built by constructing concrete walls across seasonal water channels. It is a simple and low cost method that retains rainwater and recharges underground water (thewaterproject.org/sand-dams). The Sand dams provide clean water for consumption all year round enabling communities to invest in improved agricultural practices and facilitate secure food production even in times of drought.

The supply and adequate distribution of food will continue to be a major problem for the world today and in future unless people are given assistance by governments. In many African countries, food has been used as a political tool to coerce people into submission since the continent is hard hit by climate change disasters and more often prone to severe droughts. Agro-technology which led to the Green Revolution has enabled more food to be grown in many areas with high yields in return. Thus there is need to develop such Agro-technologies and more efficient irrigation systems in order to curb malnutrition in the world. Salt water crop varieties should be developed in order to make use of sea water that is not commensurate with current

crop varieties and new forms of nitrogen fixing plants that will be well adapted to changing climates expected in food growing regions.

5.12 Conclusion

In conclusion, the evaluation of the research findings in this chapter points to the need for religious inclusion in the global efforts to mitigate climate change. Despite globalisation trajectories, religious influence in society is increasing. Religion was able to stand the basic and elementary test of credibility and time. External forces for example, the secularisation thesis tried but failed to substitute religion with science. It was noted instead that, religion was gaining momentum and influence not only in world politics and governance, but also in the way it encourages serious attention to conservation ethics and its moral dimension that obligate humanity to take care of all creation in a sense of stewardship.

Noteworthy is the fact that, in isolation, natural sciences will not succeed in offering definitive solutions to the problems faced by humankind today. It has been a long time since scientists warn of the possible dangers of the changing climate and the irreversible effects of continued pollution of the atmosphere without meaningful action taken. The missing link to all the reluctance by global climate actors is the moral aspect and inclusivity. Religion is a coping mechanism in itself that is able to inspire people to accept responsibility and cope with hardships and suffering in a way that prevents a repeat of tragedy.

Also noted was the issue of attacking climate change mitigation in collaboration with other disciplines as the most plausible way. All actors must be accorded the same privileges to offer solutions and not make climate change mitigation a preserve of natural sciences alone because science alone cannot save the planet. Religion has proved to be a powerful tool in helping countries deal with conflicts and ensure peace prevails. It also provides moral fibre to ensure environmental conservation. As such, lower levels of society need to empowered in order for the bottom-top approach to be effective whereby action begins at local level going up because the top-bottom approach has not worked.

Chapter 6

Recommendations and conclusion

6.1 Introduction

Having made attempts in earlier chapters to comprehend the environmental problems that humanity is facing today, this chapter shall outline the summary of the arguments presented above. The arguments noted in this study are, the erosion of human morality, technology gaps, population growth, exclusion of the religious dimension in climate change mitigation, negative perceptions with regards to climate change and lack of common ground among humans. This chapter shall also indicate how the goals set in this research were achieved, indicating the limit of this research together with the areas that need further research.

6.2 Summary of findings and recommendations

Climate change is not a new phenomenon in the world today. There have been natural climate changes as indicated in chapter 2. Biotic processes, variations in solar radiation on the earth's surface and volcanic eruptions are some of the natural factors that led to changes in climate. However, the earth was able to cope with these changes without major threats to the environment. With the advancement of technology, Agricultural and Industrial revolutions brought with them major developments that altered the natural processes of the earth. It was noted in this study that human action is the major factor behind the rise of Anthropogenic climate change where humanity neglected her duties to conserve the natural world to fulfil selfish needs through exploitation of finite resources. Forest lands were cleared to make way for agriculture and other development projects with little steps being taken to replenish that which humanity had used.

It was further observed in this study that climate change has had negative impacts on the well-being of all creation affecting the poor and vulnerable heavily. Pollution for example, continues to affect all creation on land and in water leading to extinction of other animal species through poisoning. Decreased food production leading to malnutrition especially in poor communities, disease outbreaks, contamination of water bodies, natural disasters like droughts and heat waves, sea level rise are some of the dangers threatening life on planet earth.

This study noted the limitations by natural sciences to save the planet alone. Of concern is continuing destruction of the natural world despite scientific findings and warnings against environmental exploitation. The major problem is that of not considering the possible contributions from religion which compels people to live in harmony with all creation. The influence of religion must not be ignored since it confers and engenders positive attitudes in human beings with the understanding that the Earth sustains life therefore humanity must not disrupt its natural balance. In return, the environment is protected.

Technology and information barriers were also noted as major blockages to climate coping mechanisms especially in upcoming economies. Most people in remote communities do not have adequate information and capital to empower themselves and take necessary actions to evade the impact of climate change. Some areas visited by this researcher have no access to print and electronic media making them more vulnerable to weather fluctuations. For example, in Muzarabani area, the majority of people do not have access to news coverage on weather forecasts and for many times they had to be rescued by the government through the Air Force of Zimbabwe after their area was hit by severe floods. Further to that, some Apostolic Churches that do not allow followers to listen to Radio or Television have little information on climate change.

In this regard, this study recommends that schools curricular and church related institutions include climate education through government and Christian leadership initiatives. Targeting schools and churches is important because by equipping youths today, future life is prepared for. Planetary conservation education and awareness must be taken to schools from primary level so that by the time pupils complete school, they will be responsible citizens in their communities and places of work. On the other hand, churches also play their role in educating congregants from Sunday school level. This will serve as a powerful tool to reach out to many young people thereby ensuring sustainable use of the world's resources.

By conferring moral values to humans, religions are rightly placed to help in shaping human attitudes towards environmental conservation. Of paramount importance is the role that religion can play in helping communities to cope with the problem of climate change. In the discussion above, it was pointed out that the crisis that

humanity is facing today is a moral problem on the part of humans which also requires moral solutions. Christianity and Shona religions confer to humanity those attitudes that help to conserve the environment and these attitudes are very important in environmental conservation since they are anchored on beliefs in the Supernatural authority. Restrictions and taboos in Shona religion and the belief that humans are the custodians of ancestral land have helped people to take care of the environment. Engaging the religious community in the fight against climate change problems is an effective tool that brings all people to action.

This study also observed that religions have a rich base of Indigenous Knowledge Systems. These knowledge systems are an effective weather forecasting tool that is used by people in less developed communities. Also noted was the fact that there is a gap between the old and the young where young people reject Indigenous Knowledge Systems in favour of Scientific Weather Indicators (SWI). This study therefore recommends a complementary approach between IKS and SWI and that information must be given in schools so that young people have an appreciation of Indigenous Knowledge Systems which plays an integral part in weather forecasting. Further to that, there is need for thorough documentation of Indigenous Knowledge Systems for easy circulation of information.

Of concern to Religion and Ecology is the ever increasing human population. When considering ways to limit population growth, it is critical to appreciate the powerful momentum towards population increases that come from the current population. The world over, there are many young adults who have reached child bearing stage and their number continues to increase dramatically. Despite global efforts to try and shift to lower population growth rates, these people are set to increase the population in a few decades to come. Suppose these young adults at child bearing stage are 1 billion and each person give birth to only two children in a space of 7 years, this means an additional 2 billion people in the world that is already failing to come to terms with a huge population.

It is crucial to take note of the fact that the target of stabilising human population now is critical in terms of the human impact on the environment and its finite resources. This study also recommends that human population must be stabilised with religions of the world taking a leading role in encouraging their adherents to implement a

Voluntary Birth Limit. Not only religions must act, natural sciences on the other hand will be providing technical information and tools to use like birth control contraceptives because what is important is for the world to work together and save the environment. With improved medical technology, death rates have decreased and will not exceed birth rates leaving the option of low fertility.

In light of this heart rendering fact, all spheres of society must embrace and seriously consider the need to empower women in society through equal opportunities with men in education, employment, independence of thought and decision making especially when it comes to marriage and child bearing among many critical issues not mentioned here. This is critical because the issue of raising children has been an area of contention in both Christianity and Shona religion. Many people fear that delaying to bear children has drastic consequences of dying and leaving no child on earth considering the life expectancy that has dropped to around 59 years as per the World Bank index 2015.

More so, it was noted in this study that many people feel having fewer children is dangerous because there is likelihood of them dying young from childhood killer diseases like measles and many others (Marufu interview 18/06/18 in Harare). On the other hand, Christians especially the majority of African Initiated Churches (A.I.C.s), rely on the Biblical charge that encourages people to multiply like the sand of the sea (Genesis 1:28; 22:17; 32:12). Ignorance is destroying many people in poor countries. A survey this researcher held on 20/06/18 in Chakara in Mashonaland West Province with one of the A.I.C's Johane Marange Apostolic Church, members indicated that not even a single person had the idea of the changing climate and the use condoms to them is not acceptable. As such, information on climate change and population growth must to be given to these religious groups and it must be incorporated into their worship services to be talked about every time they gather. While it is true that God takes care of all humanity, there is need for humanity to exercise restraint and limit population outburst.

Development patterns must be revised in order to restore the natural balance of the Earth back to its normal functional levels. This study recommends development that is anchored on moral responsibility and consider sustainable energy resources that

do not pollute the environment. Manufacturing companies have been disposing waste matter directly into the environment destroying aquatic systems and the natural habitat. Goods are mass produced in order to meet the demands of the high population. In poor countries, the problem is about the scramble for survival and in developed nations the situation is about overconsumption thus the destruction of the environment has been going unchecked. In light of this, this study recommends development practices that start with ethical environmental considerations and employ sustainable development methods in agriculture and manufacturing.

6.3 Limitations and areas needing further research

Religion has the ability to inform positive attitudes to nature. However, there are hindrances that limit achieving the full potential of religion in engendering positive nature conservation. Considering the issue of human population, the problem that was noted in this study with regards to stabilization of the population among the Shona people is the issue of having male children in the family. People will keep on bearing children until they get male children since in the African understanding anchored on beliefs, every man must have many male children. This is an area needing further research in order to help people facing the problem because it is not only prevalent in Shona religion but in most African communities.

The other area needing further research and documentation is the issue of Indigenous Knowledge Systems. These have proved to be very effective at community level but they are not documented thereby depriving the majority of vital information. As has been indicated, there are fears from many people that bringing religion into the climate change discourse will jeopardise objectivity and scientific investigation. In fact, bringing religion into the climate change programmes can help by creating a self-conscious moral society that values all creation as equally important. Indigenous Knowledge Systems are themselves a science that has been tested by indigenous peoples and found to be useful. Through lived experiences and observation indigenous peoples came up with these Knowledge systems which sustained them to this day. Christianity and Shona religions as presented in this study have practical teachings, knowledge systems, beliefs and practices that engender positive attitudes to nature which must be tapped in order to save the environment from total demise.

6.4 Conclusion

In conclusion, the major thrust of this thesis was to establish whether religion has a role to play in climate change mitigation. Indeed, religion has a role to play, and has the potential to become a leading moral and ethical authority, in the global fight against climate change. This conclusion was reached after a thorough assessment of the attitudes, beliefs and practices towards the environment in Christian and Shona religions. This study established that there is a closer relationship between religion and the environment where by religion has had major positive influences on the natural world. Animism is one case in point where a spiritual link is made between humanity and the natural world. This is a belief that is found amongst many traditional peoples whose approach to conservation is anchored on beliefs.

The pivotal role of religion in climate change debates hinges on the religious functions in society and its ability to inspire religious adherents to live in harmony with the natural world. Religious worldviews inform attitudes for a large number of people thus making it a crucial driving force for environmental conservation. It is clear from the above discussion that different religions share a common environmental ethic that based on living in harmony with the natural world. It is within this context that in Zimbabwe, for example, specimens of original tree species still exist in Chirinda forest in Manicaland Province because of the restrictions and taboos against cutting of trees in that forest.

Noteworthy is fact that religion creates strong rules that believers unquestionably adhere to and show people their limitations. The belief in the transcendent authority that controls the universe is important therefore the believers' response to the stewardship call is progressive. It is the moral aspect in religion that help build relationships between people and the world around them. The majority of people still live within the confines of world views dominated by religion making the role of religion to the existing crisis more crucial.

Sacred sites are places of spiritual and biological significance to indigenous peoples. These places are created and maintained by communities who adhere to indigenous beliefs and practices. Shifting away from these indigenous norms is dangerous to nature. So by engaging local peoples and embracing their lived views and

experiences in climate mitigation programmes, coping with climate change is achievable.

Bibliography

Agarwal. S.K., 2011, Global Warming and Climate Change (Past, Present and Future), APH Publishing Corporation, New Delhi.

Ana, S., (ed.), 1998, Sustainability and Globalisation, WWC Publications, Geneva.

Beach, D.N., 1994, The Shona and their Neighbours, Blackwell, London, p281.

Berger, J.J., 2000, Beating the Heat: Why and How we must combat Global Warming, Berkeley Hills Books, California.

Bourdillon, M.F.C., 1997, The Shona People: Ethnography of the Shona, Mambo Press, Gweru.

Centre for peace Initiatives in Africa, 2005, Zimbabwe The Next 25 Years, Benaby Printing and Publishing (Pvt) Ltd, Harare.

Cox, J.L., 1998, Expressing the Sacred: An Introduction to the Phenomenology of Religion, University of Zimbabwe Publications, Harare.

Colinvaux, P.A., 1993, Introduction to Ecology, John Willey and Sons, New York and Toronto.

Creswell, J.W., 1997, Qualitative Inquiry and Research Design: Choosing Among Five Approaches, Sage Publications, London and New Delhi.

Creswell, J.W., 2003, Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, second edition, SAGE Publications, London and New Delhi.

Daneel, M.L.,1999, African Earth-Keepers: Environmental Mission and Liberation in Christian Perspectives, volume 2, UNISA Press, Pretoria.

Daneel, M.L., 2001, African Earth-keepers: Holistic Interfaith Mission, Orbis Books, New York.

Falk, M.L., 2010, Religion and Climate Change, Orbis Books, New York.

Gathogo, J.M., 2000, The Relevance and Influence of African Religion in Post-Apartheid South Africa and Beyond, UNISA Press, Pretoria.

Gerten, D. and Sigurd, B., 2012, Religion in Environmental Climate Change, Continuum, New York.

Gelfand, M., 1972, Shona Religion, Mambo Pres, Gweru.

Gore, A., 2007, Earth in The Balance: Forging a New Common Purpose, Earth-Scan, London-Sterling, VA.

Gottlieb, R.S., (ed.), 2004, This Sacred Earth: Religion Nature Environment, Routledge, London and New York.

Gupta, J., 2001, Our Simmering Planet: What to do about Global Warming, Zed Books, New York.

Hessel, D.T. and Ruether, R.R., (eds.), 2000, Christianity and Ecology: Seeking the Well-Being of the Earth and Humans, Harvard University Press, New York.

Heywood, A., 2007, Political Ideologies: An Introduction, 4th edition, Palgrave Macmillan, New York.

Holm, J. and Bowker, J., (eds.), (1994), Attitudes to Nature: Themes in Religious Studies, Pinter Publishers, London and New York.

Houghton, J., 1994, The Complete Briefing, Cambridge University Press, London.

Hunn, J., 1993, Religiuos Beliefs and Practices, Westview Press, Colorado.

Idowu, E.B., 1973, African Traditional Religion: A Definition, Orbis Books, New York.

Inglis, J.T., 1993, Traditional Ecological Knowledge: Concepts and Cases, International Development Research Centre, Ottawa.

Jacobs, D.W., (ed.) 2003, World Book: Focus on Terrorism, Scott Fetzer Company, Chicago.

Kellogg, W.W. and Schware, R., 1981, Climate Change and Society: Consequences of Increasing Atmospheric Carbon Dioxide, West View Press, Colorado.

Magesa, L., 1998, African Religions: The Moral Traditions of Abundant Life, Orbis Books, New York.

Mangena, F., 2012, On Ubuntu and Retributive Punishment in Korekore-Nyombwe Culture: Emerging Ethical Perspectives, Best Practices Books, Harare.

Marchetti, C., 1997, Constructive Solutions to the Carbon Dioxide Problem: Man`s Impact on Climate, Elsevier, New York.

Martin-Schramm, J.B. and Strivers, R.L., 2003, Christian Environmental Ethics: A Case Method Approach, Orbis Books, Marry-knoll, New York.

Matera, S, Valdivia, C, and Gilles, J., 1991, Indigenous Knowledge Systems: Characteristics and Importance to Climate Uncertainties, Missouri, University Press.

Mbiti, J.S., 1969, Africa Religions and Philosophy, University Press, Nairobi.

Mbiti, J.S., 1975, Introduction to African Religion, Heinemann, Nairobi.

McGrath, A.L., 2003, Christian Theology: An Introduction (3rd edition), Blackwell Printing, London.

Mugambi, J., 2004, Religion and Social Construction of Reality, Heinemann, Nairobi.

Mugambi, J.N.K. and Mika, V., 2001, Christian Theology and Environmental Responsibility, Acton Publishers, Nairobi.

Moustakas, C.E., 1994, Phenomenological Research Methods, Sage Publications, Thousand Oaks, California.

Okot p`Bitek, 1993, Decolonising African Religion, East African Literature Bureau, Nairobi.

Patz, J., Campbell-Lendrum, Halloway, T. and Foley, J.A., 2005, Impact of Regional Climate Change on Human Health, APH Publishing Corporation, New Delhi.

Pittock, A.B., Flakes, L.A., Jenssen, D., Peterson, J.A. and Zillman, J.W., 1988, Climate Change and Variability: A Southern Perspective, Cambridge University Press, London.

Rosenzweig, C. and Parry, M.L., 1994, Potential impact of Climate Change on World Food Supply.

Roskin, M.G., Cord, R.L., Medeiros, J.A., 2006, Political Science: An Introduction (9th edition), Upper Saddle River, New Jersey.

Russell, B., 2010, History of Western Philosophy, Routledge, London.

Smart, N., 1973, The Phenomenology of Religion, Springer, London.

Smith, D.M., 2006, Just One Planet, Poverty, Justice and Climate Change, Practical Action Publishers, London.

Stausberg, M. and Engler, S., (eds.) 2011, The Routledge Handbook of Research Methods in the Study of Religion, Routledge, London and New York.

Strydom, H.A. and King, N.D., (eds.) 2009, Environmental Management in South Africa (2nd edition), Juta, Cape Town.

Taringa, N.T., 2014, Towards an Africa-Christian Environmental Ethic, University of Bamberg Press, Bamberg.

Weber, M., 1966, The Sociology of Religion, Methuen and Co, London, Oxford University Press.

Young, W.A., 1997, The World`s Religions: World views and Contemporary Issues, (2nd edition), Upper Saddle River, New Jersey.

Zhakata, W., (ed.), 2004, Climate Change and Mitigation Strategies in Zimbabwe, Ministry of Environment and Tourism Zimbabwe, and Ministry of Foreign Affairs, The Netherlands, Harare.

Articles in Journals and books, Journals, Reports and Newspapers

Amanze, J.N., 2010, African Traditional Religion in Contemporary Africa: Challenges and Prospects, in Biblical Studies, Theology, Religion and Philosophy: An Introduction for African Universities, Zapf Chancery, Eldoret, p 283-306.

American National Research Council, 2010, Advancing the Science of Climate Change, National Academic Press, Washington DC.

Beyers, J., 2016, What does Religion have to say about Ecology? A New Appraisal of Naturalism, in the Journal for the Study of Religions and Ideologies, volume15 (45), p 4-6.

Catholic Commission for Justice and Peace in Zimbabwe, 1997, Report on the 1980s Disturbances in Matabeleland and Midlands.

Comerford, M., 2007, The Angolan Churches from the Bicesse to the Luena Peace Agreements (1991-2002), in the Journal of Religion in Africa.

Crocker, B., 2013, Environmental and Health Issues in the Zambian Copper Belt. Accessed from *https://globaljournalist.org/2013*

Davies, D., 1994, Introduction: Raising the Issues, in Holm J and Bowker J (eds.), Attitudes to Nature: Themes in Religious Studies, Pinter Publishers, London, p 1-6.

Dwivedi, O.P.,1993, Human Responsibility and the Environment: A Hindu Perspective, In Journal of Hindu-Christian Studies, APH Publishing Corporation, New Delhi, p 19-26.

Engel, J.R., 1990, The Ethics of Sustainable development, in Ethics of Environment and Development: Global Challenges and International Responses, Belhaven Press, London, p 123-130.

Fisher, A., 1990, Is The Earth Heating? In The World Book Annual Science Supplement, Scott Fetzer Company, Chicago, London, Sydney, Toronto, p 128-131.

Makaudze, G., and Gudhlanga, E.S., 2014, Shona Religion Holistically Portrayed: Selected Solomon Mutsvairo Novels, in The Journal of Pan-African Studies, volume 16 (8) Great Zimbabwe University, Masvingo, p88-89.

Mapara, J., 2009, Indigenous Knowledge Systems in Zimbabwe: Juxtaposing Post-Colonial Theory, in Journal of Pan-African Studies 3(1), p 139-150.

Ndiweni, NJ., Mashonganyika, S., Ncube, N and Dube, N., 2014, Informal Economy as a Source of Livelihood in Zimbabwean Urban Areas: The Case of Bulawayo Metropolitan Province, In the International Journal of Scientific and Research Publications 4(1), p 3-5.

Nisbet, M.C., Hixon, M.A., Moore, K.D., and Nelson, M., 2006, Four Cultures: New Synergies for Engaging Society on Climate Change, in Journal of Ecological Society of America, New York, p 329-331.

Okon, A.O., Simeon, A.S., and Dimgba, D.E., 2013, The need to Re-Conceptualize African Traditional Religion, in International Multidisciplinary Journal, Ethiopia, volume 7 (3), 15-22.

Palmer, M., 1990, The Encounter of Religion and Conservation, in Ethics of the Environment and Development: Global Challenges and International Responses, Belhaven Press, London, p 83.

Ranger, O.T., African Traditional Religion, Sutherland et-al 1988, The World's Religions, Routledge, London, p 868.

Raloff, J., 1990, The Growing Garbage Mess, in The World Book Annual Science Supplement, Scott Frazer Company, Chicago, London, Sydney, Toronto, p 57-63.

Sachdeva, S., 2016, Religious Identity, Beliefs and Views about Climate Change, in Oxford Research Encyclopaedia, p178.

Toroitich, I.K and Kerber, G., 2012, Diakonia, Sustainability and Climate Change, in the World Council of Churches Ecumenical Review, John Wiley and Sons Ltd, p 296-297.

Veldman, R.G., Szasz, A. and Haluza-Delay, R., 2012, Introduction to Climate Change and Religion: A Review of Existing Research, in Journal for the Study of Religion, Nature and Culture, Equinox Publishing Ltd, Sheffield, p 34.

White, L., 1969, The Historical Roots of our Ecological Crisis, In Journal of American Scientific Affiliation, University of California, California, p 42-47.

Newspaper articles

Chitemba, B., Officials Looted Chiadzwa Diamonds, in the Sunday Mail 11 February 2018, www.sundaynews.co.zw.

Kadani, T., Sewer flowing into Lake Chivero, in the Sunday Mail 7 February 2016, Harare, Zimbabwe, www.sundaymail.co.zw.

Kunambura, A., Missing $15 billion Haunts Minister, in the Daily News 1 January 2018, https://www.dailynews.co.zw

Manyepo, T., Tobacco farmers destroy 50 thousand hectares of forests annually, in the Herald 7 June 2016, Harare, Zimbabwe, https://www.herald.co.zw

New York Post 23 September 2017, https://www.nypost.com

Richburg, K.B., Mobutu: A Rich Man in Poor Standing, in the Washington Post 3 October 1991, https://www.washingtonpost.com

Sabeta. C., Officials Nabbed for Command Agriculture Inputs Abuse, in the Herald 8 September 2017.

Online sources

Anak, A., 2018, Religion is a private affair and should be kept that way, Accessed March 6 2018 from https://www.thestar.com

Austin, R.C., 1991, Biblical Roots for Environmental Ethics, accessed 6 June 2016 from www.sunstonemagazine.com

Berkley Center for Religion, Peace and World Affairs, accessed 6 June 2016 from https://berkleycenter.georgetown.edu

Indigenous Knowledge Systems, Accessed January 4 2017 from *https://www.ema.co.zw*

Huff, R., 2014 article, Human Capital, Accessed January 4 2017 from https://www.britanica.com

IPCC, (2001), Report on Climate Change: Impacts, Adaptation, and Vulnerability, Accessed June 6 2016, from www.ipcc.ch

IPCC, (2007), Report on climate change: Impacts, Adaptation, and Vulnerability, Accessed June 6 2016, from www.ipcc.ch

Journal of Humanitarian Assistance 2002, Accessed June 6 2016, from https://sites.tufts.edu

McLean, KG., 2012, Engaging Indigenous Peoples in Global Climate Governance, Accessed June 2016 from *www.ourworld.unu.edu*.

National Statistics Agency Preliminary report, Harare, Accessed May 8 2017 from *www.zimstat.zw*

Nature Reserve and Environmental Education, Accessed May 8 2017 from *www.mukuvisiwoodlands.co.zw*

Overpopulation: Causes, Effects and Solutions, Accessed May 8 2017 from *https://www.conserve-energy.com*

reports.weforum.org>global-risks-2017

Sachdeva, S., (2016), Religious Identity, Beliefs, and Views about Climate Change.

Safcei.org/faith-perspectives.

Smit, A., 2017, 10 Effective ways to control population, Accessed May 8 2017 from https://listontap.com

Staropoli, N., 2016, Genetic Literacy Project, Accessed July 18 2016 from *https://geneticliteracyproject.org/2016*

Traditional Leaders Act 29 17, Parliament of Zimbabwe, Accessed July 18 2016 from *www.parlzim.gov.zw*

Transparency International Report, Accessed January 27 2017 from, www.africanews.com

Union of Concerned Scientists, Global Warming Solutions: Smart Solutions to reduce Emissions, Accessed August 6 2017 from *https://www.ucsusa.org*

UNFCCC, (2012), Report on Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries, Accessed June 6 2016, from http://unfccc.int/3582.php

Whelchel, H., 2012, A Biblical view of Dominion: Stewardship, In the Journal of Institute of Faith, Work and Economics, Accessed June 6 2016 from https://tifwe.org

WMO, (2016), Report, Statement on the State of the Global Climate (1189), Accessed October 28 2016, from http://public.wmo.int

www.encyclopediaofreligion.com

https://tavaana.org/en

https://www.demogr.mpg.de/en

International Monetary Fund report, *https://www.imf.org*

www.fao.org

www.science.org.au

The Lancaster House Conference, *www.panapress.co./The-Lancaster-House-Talsk*

www.nmsea.org/.../global-warming/fossil-fuels

www.our-africa.org

Interviews

Interviewees	Date of interview
Dembedza, C.	02 December 2017.
Dewa, H.	10 May 2017.
Garayi, E.	18 December 2017.
Gogo, (pseudo-name),	24 June 2018.
Gotami, S.	15 June 2018.
Jiri, K.	20 June 2018.
Joe, (pseudo-name),	06 December 2017
Macheka, Z.	14 June 2018.
Magura, K.	07 March 2017.
Maheyi, B.	13 June 2018.

Manhenga, Q.	15 May 2017.
Marufu, B.	13 June 2018.
Mazeya, P.	13 June 2017.
Moyo, S.	02 December 2017; 03 June 2018.
Muchemwa, T.,	09 December 2017.
Mugari, J.,	02 December 2017.
Murowa, D.	25 March 2018.
Mutimutema, K.	06 December 2017.
Nyazika, S.	02 December 2017.
Sibanda, K.	13 June 2017.
Shoko, K.	24 June 2018.
Spirit Medium Majokoro, T.	10 May 2017.
Spirit Medium Nehoreka	06 December 2017.
Tembo, E.	03 December 2017.
Zimombe, Z.	10 May 2017.
Zinyemba, B.	06 December 2017.
Zindoga, (pseudo-name)	08 December 2017.
Zuze, R.	14 May 2018.

Unpublished sources

Alvera, P., 2013, The Role of Indigenous Knowledge Systems in Coping with Food Security and Climate Challenges in Mbire District, Zimbabwe`, M.SC Thesis, Department of Civil Engineering, University of Zimbabwe.

Bishau, T., 1997, Religion and the Natural Environment: An Investigation into the Role of Jindwi Traditional Beliefs and Practices in Environmental protection, Honours Thesis, Department of Religious Studies, University of Zimbabwe.

Materer, S, Valdivia, C, and Gilles, J., 2001, Indigenous Knowledge Systems: Characteristics and Importance to Climate Uncertainty, Department of Agricultural Economics (3), University of Missouri-Columbia.

Atlases

Munowenyu, E.M., and Murray, S.R., (eds.),1999, Senior Atlas for Zimbabwe, Longman Zimbabwe (Pvt) Ltd, Harare.

Appendix 1: Semi-structured questionnaires

Personal details

1 Gender: Male/Female

2 Age: 18-29 30-45 46-60 61and above.

3 Marital Status: Single Married Divorced Widowed.

4 Number of family members: 1-3 4-6 7-10 11 and above.

5 Level of education: Primary Secondary Tertiary.

6 Area of originality: .....

7 Time of residence in the area in years: 1-10 11-20 21-30 30 years and above.

8 Religion …….

Weather information

8 Do you have information about climate change? Yes/No.

9 What are the noticeable weather patterns that have occurred in your area? Rainfall/temperature/seasons.

10 How did these weather changes affect farming? .....

11 Do you know any traditional ways of weather forecasting? Yes/No.

12 How do you get weather information in your area? .....

13 What do you think is a reliable weather forecasting method? Traditional/Scientific.

14 Which indigenous climate change indicators do you base your predictions on? Vegetation/animal behaviour/moon and stars.

15 How do you tell if there is going to be a drought? .....

16 How do you know if there will be more or less rainfall? .....

17 Did the predictions come true? Yes/No.

18 Are the Indigenous weather forecasting indicators still relevant today? Yes/No.

19 If yes, what are the indicators? .....

20 Are there instances where Indigenous and Scientific forecasters succeed or fail? Yes/No.

21 If yes, how often? .....

22 Do you rely on indigenous forecasting in planning for cropping? Yes/No.

Livelihoods

23 Do you have your own piece of land? Yes/No.

24 If yes, how big is it? .....

25 If no, how do you subsist? .....

26 How is land preparation done in your area? Use tractors/ox drawn ploughs/hoes.

27 How do you control weeds and pests? Use chemicals/weeding.

28 How do you cope with climate change disasters? .....

29 How do you cure tobacco? .....

30 What effects does that have on forests and the atmosphere? .....

31 How do you manage waste products in your area? .....

32 Are Traditional leaders taking their part in conserving the environment? Yes/No.

33 What effects does the land reform have on the environment? .....

34 Can the politics of land affect the environment? Yes/No.

35 How? .....

Appendix 2

Focus Group Discussions

Date of discussion.....

1 Inter-disciplinary dialogue: How best can Christian and Shona religions complement each other and help people to cope with climate change and variability?

- Hindrances to dialogue.
- Closing the barrier between Christianity and Shona religions and working a sustainable way forward.

2 Conservation farming: How best can local communities implement this?

- Methods of farming in relation to the population to be fed.
- Ensuring adequate food for all.
- Replenishing forests.
- Water conservation technologies.
- Can traditional farming practices sustain communities with adequate supplies of food?

3 Energy and fossil fuels.

- What are the sustainable sources of energy at your disposal?
- What are the alternative energy paths that can be explored to avoid heavy dependence on forests?
- What is the future of tobacco crop in Africa on the backdrop of desertification and carbon dioxide accumulation in the atmosphere?
- How best can religions help to conserve energy.

4 Waste management.

- Sustainable ways to manage wastes.
- Recycling.
- Religious inputs on waste management.

5 Population growth.

- Effects of the growing population in the world.

- The need for population stabilisation.
- The position of Christianity and Shona religions on the growing population.
- Attaining a stable population in the world.

Appendix 3

Key Informant Interviews

1 What is your age?

2 What is your occupation?

3 How long have you been in this area?

4 What methods of farming are being practiced in your area?

5 Are there weather changes that you have noticed for the past 30 years?

6 How have these changes affected food security and rainfall patterns?

7 How do you conserve the land and water?

8 What are the traditional ways that are used to protect the forests?

9 How does Shona religion foster a sense of environmental protection?

10 What are the energy sources you depend on and their effects on the environment?

11 How can the population be stabilised?

12 What are the dangers posed by Tobacco farming on Zimbabwe's forests?

13 How are the living conditions for rural people?

14 Has Zimbabwe realised the goal of land redistribution?

15 What is the influence of religious beliefs on human conduct?

16 What strengthens Shona religion in the modern scientific age?

17 Who gives morals to African people?

18 What roles do religious practitioners play in Shona religion?

19 What is the role of Traditional leaders in the community?

20 What influenced the people of Zimbabwe to wage the war in the 1970s?

21 Is totemism still relevant in today's world?

22 What role do ancestors have in safe-guarding the land?

23 Is there any inter-relationship between the people and their environment?

24 Do local leaders seek help from the Courts on matters relating to tradition?

25 What is the view of Christianity on totemism?

26 What is the Apostolic Churches' view of creation, living and non-living things?

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LETTER OF INTRODUCTION AND INFORMED CONSENT
FOR PARTICIPATION IN ACADEMIC RESEARCH

Department: Science of Religion and Missiology
Title of the study:
Religion and Ecology: Climate Change Between Christian and Shona Religious Beliefs and Practices.
Researcher:
Muza Kudakwashe
Cell: +263778326277/ +263712319517, email-kushmuza@gmail.com

You are cordially invited to participate in an academic research study due to your experience and knowledge in the research area, namely Religion and Ecology. Each participant must receive, read, understand and sign this document *before* the start of the study. If a child is 7-17 years and is requested to partake in a research study, the parent/legal guardian must give assent. Children from 7-17 years are also required to sign an assent form.

- **Purpose of the study**: The purpose of the study is to explore ways through which religion can play a role in creating a coping mechanism and establish how Religions can be involved in a bid to mitigate the effects of climate change.
- **Duration of the study**: The study will be conducted over a period of three years and its projected date of completion is December 2018.
- **Research procedures**: The study is based on library sources, publications, journals internet sources, and interviews. Interviews shall be in the form of unstructured questions asked to the participants orally.
- **What is expected of you**: The participant is expected to respond to questions asked freely without fear.
- **Your rights**: Your participation in this study is very important. You may, however, choose not to participate and you may also stop participating at any time without stating any reasons and without any negative consequences. You, as a participant, may contact the researcher at any time in order to clarify any issues pertaining to this research. The respondent as well as the researcher must each keep a copy of this signed document.
- **Confidentiality**: All information received from interviewees will be treated as private and confidential. If the participants request for anonymity, their request shall be honoured and respected in total confidence and pseudo names shall be used. In the event of persons not requesting anonymity names will appear. The researcher shall protect the identity of all the participants. Data collected

shall be compiled and the finished Thesis shall be handed to the Department of Science of Religion and Missiology at the University of Pretoria, South Africa. Should the interviewee choose to withdraw from participation, all relevant information given will be destroyed.

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WRITTEN INFORMED CONSENT

I hereby confirm that I have been informed about the nature of this research.
I understand that I may, at any stage, without prejudice, withdraw my consent and participation in the research. I have had sufficient opportunity to ask questions.

Respondent: _____

Researcher: Muza Kudakwashe

Date: _____

Contact numbers of the Researcher: 0778326277/ 0712319517

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VERBAL INFORMED CONSENT *(Only applicable if respondent cannot write)*

I, the researcher, have read and have explained fully to the respondent, named

_____ and his/her relatives, the letter of introduction. The respondent indicated that he/she understands that he/she will be free to participate in the research or withdraw at any time without being subjected to questioning.

Respondent: _____

Researcher: Muza Kudakwashe

Witness: _____

Date _____

THE METHODIST CHURCH IN ZIMBABWE

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12 December 2017

Rev. K. Muza
321 Juru Street
New Tafara
Harare

Dear Rev. K. Muza

Permission to Conduct Research with Methodist members

Your request to conduct your research through interviews, focus group discussions and questionnaires with Methodist members who are above the 18 years is hereby granted.

We understand that your focus is on the **Religion and Ecology: A Comparison of adaptive strategies for coping with climate change between Christianity and Shona religions** and we hope the information will be confined to your area of study.

I am sure your university gave you a letter of introduction which you will present to the selected individuals and groups.

Peace and love during Advent.

In His Grip

Revd Dr. J. Dube
General Secretary

METHODIST CHURCH IN ZIMBABWE
17 DEC 2017
WESLEY HOUSE
17 SELOUS AVENUE, HARARE
SIGNATURE

"Thy will be done on Earth as it is in Heaven" (Matthew 6 vs 10)

PRESIDING BISHOP: Revd Dr Solmon Zwana, LAY PRESIDENT: Mr Brown Sanyauke , GENERAL SECRETARY: Revd Dr Jimmy Dube