



Sustainable Agriculture in the Context of Climate Change in
Tanzania?

On Cultivating an African Christian Ethic of Care

By

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Declaration

As per University regulations, I hereby unambiguously declare that this thesis, unless specifically indicated within the text, is my own work and has not been submitted to any tertiary institution for similar purpose.



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13 February 2015

Date

As supervisor, I hereby approve this thesis for submission.



Dr. Clint Le Bruyns

9 March 2015

Date

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Dedication

To God's ministry through the Church of Christ in Tanzania and elsewhere.

To my family.

Abstract

Climate change, in relation to the world of agriculture, has harmed and continues to harm all forms of life on earth. This study is an attempt to explore ways through which an African Christian ethic of care can be cultivated to promote sustainable agriculture in the context of climate change in Tanzania. Using theories of ecological transformation and of responsibility, also based on qualitative approaches to inquiry, the study argues that, because the agricultural sector is both a contributor to, and a victim of, climate change, a comprehensive African Christian ethic of care can make a significant contribution towards addressing challenges of climate change and environmental degradation today.

In general this study has noted that irresponsible modern agricultural methods, coupled with a mechanistic and anthropocentric worldview, have considerably contributed to the current climatic variability. Furthermore, Christianity through its anthropocentric theological position has for many years nurtured an unsustainable relationship between human beings and God's created order. Due to Christianity's anthropocentric theological viewpoint, humankind has been placed above all other forms of life on earth, based also on the claim that the human being is God's image-bearer. This has been compounded by the perceived superiority of Western philosophy and Western scientific knowledge which has downplayed African philosophy that, on the basis of indigenous ecological knowledge, embraces some important life-affirming agricultural methods. In this regard, the study has appealed for the need for an African Christian agro-moral vision rooted in African wisdom that will enhance sustainable agriculture in the context of climate change in Tanzania.

It has been further noted in this study that the African concepts of *Ubuntu* and *Ujamaa*, as advocated by *Mwalimu* [teacher] Nyerere [the first President of the United Republic of Tanzania], contain ecological wisdom which can be harnessed in order to cultivate an African Christian ethic of care to promote truly life-affirming agricultural methods, as opposed to the irresponsible modern farming practices that have been detrimental to God's creation and that have depleted ecosystems which support life on earth. However, the study argues that the successful cultivation of an African Christian ethic of care for sustainable agriculture needs to be informed by three key factors. Firstly, climate change

and agriculture must be treated as a matter of faith, calling for traditional Christian faith formation to be revisited. Secondly, climate change and agriculture must be seen as a matter of Christian mission, hence mission and pastoral formation process has to be critically reviewed. Thirdly, climate change and agriculture should be seen as a Christian moral-theological issue which requires a reassessment of the current Christian moral formation process. The fulfilment of these factors can potentially lead to the formation of an earth-caring community.

Therefore, the study has proposed that the traditional model of Christian formation, whose objective is to impart doctrines, traditions and other worldly perspectives must be reinstated with an ecological Christian formation perspective. The purpose of ecological Christian formation must be threefold: to strengthen a responsible Christian faith, to enhance Christian responsible life and to consolidate a holistic Christian mission. This new formation process has the potential of leading to the building of an earth-caring community that recognizes faith, doctrines and traditions as fundamentals for life-enhancing agriculture and for Christian life in general. On the basis of faith, doctrines and traditions, faith communities can potentially be able to define the condition of their natural environment, to identify principles for change and to set up strategies for a transformation that seeks to enhance all forms of life on earth.

Acronym and Abbreviations

AACC	All African Conference of Churches
ADF	African Development Forum
AHS	Agro-Horticultural Society
AS	Agrarian Society
ATR	African Traditional Religion
CCS	Carbon Capture Storage
CCT	Christian Council of Tanzania
CIA	Central Intelligence Agency
CMS	Church Mission Society
COP	Conference of the Parties
CSER	Corporate Social and Environmental Responsibility
ELCT	Evangelical Lutheran Church in Tanzania
FAO	Food and Agriculture Organisation
FBOs	Faith Based Organisations
FOCCISA	Fellowship of Christian Council in Southern Africa
GDP	Gross Domestic Products
GFR	Global Forum Report
GHG	Green-House Gas
GMOs	Genetically Modified Organism
IISD	International Institute for Sustainable Development
IPCC	Intergovernmental Panel for Climate Change
IODISA	International Organisation Development in Southern Africa
IRCPT	Inter-Religious Council for Peace Tanzania
LGA	Life Giving Agriculture
MDGs	Millennium Development Goals
MEA	Millennium Ecosystem Assessment
MKUKUTA	Mkakati wa Kupunguza Umaskini na Kukuza Uchumi Tanzania

NAPA	National Adaptation Plan of Action
NCC	National Climate Campaign
NSAC	National Sustainable Agriculture Coalition
NSPREG	National Strategy for Poverty Reduction and Economic Growth
PADEP	Participatory Agriculture Development and Empowerment Project
PAN	Pesticide Action Network
PAR	Platform for Agro-biodiversity Research
PAS	Primitive Agricultural System
SACC	South African Council of Churches
SD	Southern Diocese
TINA	There is No Alternative
TADIP	Tanzania Development Initiatives Programme
UN	United Nations
UNCTAD	United Nations Conference on Trade And Development
UNEP	United Nations Environmental Programme
UNESCO	United Nations Education Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention for Climate Change
URT	United Republic of Tanzania
WCC	World Council of Churches
WMO	World Meteorological Organisation

TABLE OF CONTENTS

CHAPTER ONE	1
INTRODUCING THE STUDY	1
1.0 Introduction.....	1
1.1 Background and identification of research problem	1
1.1.1 Background of the study	1
1.1.2 Identification of the research problem	2
1.2 Rationale for the present study.....	8
1.3 Research question and objectives.....	9
1.4 The scope of the study.....	10
1.5 Significance of the study.....	11
1.6 Theoretical and methodological underpinning of the study	11
1.7 Integrating theories into the logic of the study	15
1.8 Research design and methodology	16
1.8.1 Research design.....	16
1.8.2 Research Methodology	18
1.8.3 Methods of data collection.....	18
1.8.3.1 Critical analysis of existing literature.....	18
1.8.3.2 Archival search and document analysis.....	19
1.8.3.3 Analytical tool deployed in this study.....	19
1.9 Chapter summary.....	21
CHAPTER TWO	22
CLIMATE CHANGE, WORLD OF AGRICULTURE AND THE CHURCH IN TANZANIA	22
2.1 Introduction.....	22
2.2 Tanzania’s geographical location	23
2.3 Tanzania’s socio-economic situation	24
2.4 The nature of climatic conditions in Tanzania.....	28
2.5 Public debate on climate change and the world of agriculture	32
2.5.1 Various debates on climate change	34
2.5.2 Climate change and the natural environment.....	37
2.6 Trends of climate change in Tanzania	39
2.7 Causes and impact of climate change in Tanzania.....	42
2.8 Climate change and the mission of the church	46
2.9 Chapter summary.....	49

CHAPTER THREE FARMING METHODS IN THE WORLD OF AGRICULTURE AS VICTIM OF AND CONTRIBUTOR TO CLIMATE CHANGE 51

3.1 Introduction.....51
3.2 Agriculture and its life sustaining role on earth.....52
3.3 Farming, environment and economy in the light of climate change.....54
3.4 The evolvement of the agricultural sector56
3.5 Dominant approaches to farming58
3.5.1 Traditional farming systems58
3.5.2 Modern agriculture60
3.5.3 The green revolution initiative.....61
3.6 Agriculture and climate change in Tanzania63
3.7 Farming systems during the pre-colonial and colonial periods in Tanzania65
3.8 The impact of climate change in Agriculture.....70
3.8.1 Change in biological processes72
3.8.2 Change in environmental and physical processes73
3.8.3 Impact on human health74
3.8.4 Impact on non-agricultural livelihoods75
3.9 Contribution of agriculture to climate change.....76
3.10 Chapter summary.....83

CHAPTER FOUR THEOLOGY: A PROBLEM AND PROMISE FOR LIFE-GIVING AGRICULTURE IN THE CONTEXT OF CLIMATE CHANGE?...84

4. 1 Introduction84
4. 2 Climate change, agriculture and theology:85
4. 3 Theological underpinning of climate change: An agrarian perspective89
4.3.1 Christian theology and the emergence of science and technology.....90
4.3.2 Anthropological theology and creation.....96
4.3.3 Missionary influence on the anthropocentric attitude towards nature 100
4.3.4 Anthropocentrism in emerging theologies 103
4. 4 Tilling and keeping: A theological resource for sustainable agriculture 106
4.5 Chapter summary..... 115

CHAPTER FIVE AFRICAN CHRISTIAN AGRO-MORAL-THEOLOGICAL VISION IN THE CONTEXT OF CLIMATE CHANGE117

5.1 Introduction..... 117
5. 2 Discerning moral-theological implications of climate change 118
5.3 The nature of existing Christian ethics 124
5.4 Re-envisioning Christian ethics to enhance agro-moral vision..... 127

5.4 .1 Redeeming the divine vocation of caring for the earth	127
5.4.2 Re-interpreting eco-dominion theology	131
5.4.3 Reclaiming African cosmo-vision to enhance agro-moral vision.....	135
5.5 Chapter summary.....	139

CHAPTER SIX AFRICAN INDIGENOUS ECOLOGICAL KNOWLEDGE TO ENHANCE AGRO-MORAL-THEOLOGICAL VISION IN RESPONSE TO CLIMATE CHANGE.....141

6.1 Introduction.....	141
6.2 African indigenous knowledge and scientific knowledge	142
6.3 Conceptualising African indigenous knowledge	147
6.4 Uncovering African indigenous ecological knowledge	150
6.5 Potentials of African ecological knowledge to enhance agro-moral vision	153
6.6 Indigenous ecological knowledge and an African Christian agro-moral vision	159
6.7 Chapter summary.....	165

CHAPTER SEVEN CULTIVATING AN AFRICAN CHRISTIAN ETHIC OF CARE FOR SUSTAINABLE AGRICULTURE IN THE CONTEXT OF CLIMATE CHANGE..... 167

7.1 Introduction.....	167
7.2 Conceptualising ethics of care	168
7.3 Emergence of ethics of care.....	169
7.4 Saving the soil: Responsible care through life-enhancing agriculture	174
7.5 Creation care and agriculture: A new mission frontier.....	179
7.6 Eco-Mission as creation care	180
7.7 Cultivating African Christian ethics of care for sustainable agriculture.....	183
7.7.1 Sustainable agriculture: A Christian faith concern.....	183
7.7.2 Sustainable agriculture: A mission concern	186
7.7.3 Sustainable agriculture as pastoral issue: An ecological therapy	191
7.7.4 Sustainable agriculture: A key to African Christian ethic of care	192
7.8. A formation of earth-caring community to enhance sustainable agriculture.....	193
7.8.1 Re-envisioning Christian discipleship	194
7.8.2 Re-envisioning African Christian moral formation	202
7.8.3 Cultivating an African Christian ethic of care through eco-moral formation	209
7.7 Chapter summary.....	217

CHAPTER EIGHT CONCLUDING OBSERVATIONS AND RECOMMENDATIONS..... 219

8.1 Introduction.....	219
8.2 Postulating the thesis of the study.....	219

8.3 The study's contribution to the body of knowledge	223
8.4 Limitations and recommendations for further research	226
8.5 Conclusion	228
BIBLIOGRAPHY:.....	230
APPENDICES.....	264
Appendices 1 Ethical Clearance Letter	264
Appendix 2: Turnitin Report.....	265

CHAPTER ONE

INTRODUCING THE STUDY

1.0 Introduction

Climate change and agriculture are both environmental and theological concerns. However, in the African context in general and Tanzania in particular, little has been done to expose such conceptual links in effort to transform human attitudes towards God's created order, thus curbing the adverse impact of climate change. This chapter offers a general overview of the study which seeks to explore ways through which an African Christian ethic of care can be cultivated for sustainable agriculture in the context of climate change in Tanzania. It presents the entire research design, which constitutes various aspects of scientific studies such as the background to the study and identification of the research problem, rationale, research questions and objectives, research methodology and method, theoretical underpinning, as well as analytical tools employed.

1.1 Background and identification of research problem

1.1.1 Background of the study

This study has explored ways through which an African Christian ethic of care can be cultivated to advance sustainable agriculture in the context of climate change, with special reference to Tanzania. Three factors form the background of, and the motivation for, this study. Firstly, the researcher grew up in a rural area and has, as an ordained minister, worked with rural communities where it became apparent to him that the current climatic crisis affects the majority of people in Tanzania.

Secondly, studies in theology and development programmes have exposed the researcher to various issues of social concern. These include issues of poverty, globalization, in particular economic globalization, neo-liberal economic policies, economic injustices, food insecurity, ecological injustice, and environmental degradation. It was noted that all of these issues have jointly had an adverse impact on human life in general, on economic

activities, especially in the agricultural sector, and on the natural environment in rural communities in Tanzania.

Thirdly, for his Masters Dissertation, the researcher (Nduye, 2011:55-79) conducted a study on “Tilling and keeping the earth in an unjust economic order: Towards an African eco-theological framework.” In this thesis, among other things, the researcher outlined six principles that potentially could constitute an African, life sustaining eco-theological framework that would help Christian faith communities in addressing issues of food insecurity and environmental degradation. These principles include an African worldview, a life-centred vision, a focus on sustainability, an African ethic of care, a holistic understanding of salvation, and recognizing the ecumenical nature of earth.

Therefore, building on the previous study and experience, the present research takes up the aspect of care, in order to further explore the potential of an ethic of care for transforming current human attitudes so as to include strong moral responsibility for the natural environment, through practicing sustainable agriculture in the context of climate change. This is particularly important in Tanzania where a large proportion of the population interacts with the natural environment through agricultural activities. In affirmation of this reality, the United Republic of Tanzania (URT, 2003:4) has indicated that Tanzania is endowed with enough arable land for various purposes and that more than eighty percent of Tanzanians live in rural areas with their livelihoods depending on agricultural activities. However, people are suffering from the impact of climate change which is, *inter alia*, the result of prolonged unsustainable agricultural methods (Timberlake, 1994:4). Thus, the three factors mentioned above offer both the background and the motivation for this study, the focus of which is on climate change, agriculture and an African Christian ethic of care.

1.1.2 Identification of the research problem

It is widely acknowledged that the problem of climate change is anthropogenic in nature and that developing countries are most vulnerable to, and most affected by, climate change because of their low capacity to adapt (Williams and Kniveton, 2011:1). Similarly, the Tanzania Development Initiatives Programme (TADIP, 2011:1-2) advances that climate change is worldwide developmental concern that has claimed attention from

many parts of the world where human induced forces constitute a major cause. This is true for the African continent where, as the literature reveals, issues such as “population growth, underdevelopment and poverty, socio-economic, political and environmental factors” make the region more vulnerable to the extremes of climate change (Williams and Kniveton, 2011:1-2). Studies concerning Tanzania have identified key symptomatic areas which portray signs of climate change. These signs include massive soil degradation, air and water pollution and lack of good quality water in both rural and urban areas, loss of wildlife habitats and biodiversity, increased desertification, overstocking, and the massive spread of garbage and plastic waste (Msafiri, 2007: xv). Furthermore, TADIP (2011:15) adds, the impact of climate change on agriculture is demonstrated by declining crop yields, poor farming methods, increased livestock and agronomy diseases, and decline in fertility levels of soil, etc.

Similarly, Yanda and Mubaya (2011:vii) state that climate change in Tanzania is evidenced through higher temperatures, change in precipitation, and a rise in the sea level as a result of ice and snow meltdown. Although ecological problems have been recognized and understood as being scientific and technological in nature, there is currently increased agreement that the ecological crisis is multifaceted. The ecological crisis is characterized by multiple and deep ethical and moral aspects with religious, ideological, philosophical, cultural, historical, and theological dimensions. Adu-Gyamfi (2011:145) equally argue that in every respect, i.e. socially, economically and ecologically, but also culturally, ideologically and spiritually, climate change is marked as a serious crisis which needs an immediate response from persons of all walks of life. In the same way Ayre (2008c:64) points out that “issues such as looming environmental refugee crisis, loss of food production, implication for disease and security together with additional power requirements” constitute some of the products of climate change. This is, because it is human beings and their activities that cause harm to ecological systems.

In this regard, the process of understanding and addressing climate change in Tanzania, as well as in Africa as a whole, requires an interdisciplinary approach which, thus far, has been lacking to a certain degree (Msafiri, 2007: vxi; Williams and Kniveton, 2011:2). It is in this context that Conradie (2008:10) points out that, particularly in Africa, climate change challenges the church to re-evaluate its position and to adopt an active role in addressing climate change. In addition, Williams (2010:232) argues that the context of climate change calls for a change of human consciousness and that humankind should

become a restorer of justice not only for itself but for all species. One way in which humankind exploits the natural environment is through unsustainable ways of doing agriculture.

According to Malley (1999:15) and Tughe (2007:1), the introduction of modern farming methods that side-lined traditional farming methods has increased incidences of climate change in Tanzania. This is the case due to the fact that such modern farming methods are environmentally insensitive. Two major modern farming methods recorded in the history of agricultural development are industrial farming and the “green revolution”, both involving highly mechanized modes of production. Their impressive capacity for increasing yields and profits came at the expense of the natural environment. The concentrated utilization of industrial fertilizers, intensive irrigation systems and genetically modified seeds (GMOs) has led to depletion of the natural nutrients and the resilience of the soil. As a result, much of the natural fertility of the soil has been lost and the salinisation of agricultural soil increased, thus exacerbating situations of climate change, especially in Tanzania as will be demonstrated later in this study (Fitzgerald-Moore and Parai, 1996:5-6). In general, it appears that modern agricultural methods have not respected the natural environment and its ability to regulate natural climatic conditions.

It is against this background that the researcher was prompted to search for ways in which an African Christian ethic of care could be cultivated to enhance sustainable agriculture, while promoting a sense of human moral responsibility towards the natural environment in the Tanzanian farming communities. There are two main reasons for the need for an African Christian ethic of care for sustainable agriculture, according to Shutte (2001:12) and Mkhize (2008:35). The first reason is the African worldview which is communal in nature and which embraces values that are environmentally sensitive. Although the term worldview can mean different things to different people, this study underscores worldview as mental framework which influences people to interpret the nature of reality, nature and purpose of life and laws that governs human relationships in a given context. According to International Education for Peace Institute (2007:29-30), it is the worldview that shapes human approach to life whereas life experiences also shapes human worldviews. This means that it is the worldview which controls the way humankind perceives, interprets, understands, and responds to various realities of life in respective context. It is the worldview that affects the way people view themselves,

others and the natural world around them. In the light of this, it becomes evident that worldview is the most powerful aspect in human life through which the understanding of the world and the purpose of life in the world are created. Seemingly, this is the case because the worldview that people adopt determines the nature of relationship they develop, the kind of societies they create, the way they approach issues of science and religion and the manner in which they respond to challenges and opportunities they encounter in their lives (International Education for Peace Institute, 2007:31). Therefore, it is within these parameters that the term worldview has been deployed throughout this study (See more details in chapter 6).

Secondly, in the African context, ethical concerns are practical and cannot be divorced from the lived experience of the people in question. African indigenous knowledge, therefore, has the potential to provide some insights that connect people directly to their natural environment and the changes that occur within it (Nyong, Adesina and Elasha, 2007:792).

The Conference of the Parties (COP17/CMP 7) to the United Nations Framework Convention on Climate Change (UNFCCC) was convened in Durban, South Africa in 2011. The conference was concluded with extending a call to the entire global community to work together to address environmental problems that exacerbate climate change and insisted on the need for cooperation to save the planet (Nkoana-Mashabane, 2011:3). This is the case because, adds Inter-Religious Dialogue Council for Peace Tanzania (IRCPT, 2012:1), climate change is a multifaceted crisis which calls forth solutions that profiles the well-being of all, especially those in the disadvantaged communities. Moreover, in the UNFCCC document article 4 (UN. 1992:5), where various commitments are outlined for all parties to adhere to, agriculture is listed among the sectors that require a high concentration in order to reduce anthropogenic emissions of greenhouse gases (GHG). It is further stated that countries, particularly African countries, should develop elaborate, appropriate, and integrated plans for agricultural management in the face of climate change.

Hedger (2011:1-2) asserts that the centrality of agriculture in climate change negotiations is based on the fact that it plays the roles of both victim and villain or abettor (the responsible one) of climate change. Agriculture is a victim because climate change subjects it to low productivity and income instability leading to an increase in food

insecurity. On the other hand, agriculture is co-responsible for climate change as it emits significant amounts of nitrous oxide, predominantly from chemical fertilizers, methane, mainly from livestock reduction, and carbon from change of land use such as deforestation, various form of degradation, peat fires and food processing (see chapter 3).

Yet, agriculture is believed to potentially be part of the solution to the climate change problem through the transformation of agricultural methods and human attitudes towards the natural environment (Hedger, 2011:2). In accordance with this, the South African Council of Churches (SACC) points out that leaders of faith communities from 30 countries around the world have identified environmental degradation, which aggravates climate change, as the greatest threat that humanity has ever faced and that collaboration and participation of all humankind is fundamental in addressing the problem. In the context of Tanzania, the Inter-Religious Council for Peace Tanzania (IRCPT, 2012:1) has contended that “faith communities have a crucial role to play in pressing for changes in behaviour at every level of the society and in every economic sector.” Given the magnitude of the problem, people have a common responsibility to heal the created order. In this process a specific focus on ecological concerns in agriculture could be used as an entry point to the quest for alternative agricultural methods. After all, agriculture is one of the fundamentals of life which any economic or production system may be called upon to serve (SACC, 2009:4; LenkaBula 2009:109-110).

According to Msafiri (2007:1-2), sixty percent of the land in Tanzania is seriously threatened by encroaching desertification. It is an agricultural country where more than eighty percent of the population is engaged in farming activities, characterised by low productivity due to a number of factors. These include poor resource endowments, adverse policies, continued environmental degradation, high population growth, and low levels of investment in agricultural infrastructure (Luwoga, 2009:25).

Obviously, for social, economic and ecological reasons, the environmental crisis is a serious and actual problem in Tanzania which needs to be addressed. Trapped in modern farming practices, Tanzania has, for a number of years now, based its agricultural activities on chemical fertilizer which has necessitated the country to build fertilizer

factories. At the same time, the teaching of life supporting farming methods in schools was stopped. As a result, in many areas in Tanzania, nothing is done to re-fertilize depleted soil, hence reducing the capacity of the natural environment to regulate the natural climate (Timberlake, 1994:122).

Due to Western influence through the global industrial-economic system, farmers in Tanzania are forced to adopt industrial farming methods which are detrimental to the environment and which only a few can afford. As a result, Tanzania, as it is for other countries, is seriously challenged by climate change (Odhiambo, 1980:164; Scherr and McNeely, 2001:6). Reflecting on the involvement of the church in issues of environmental crisis, Althaus (1972:xix) contends that, for centuries, Western Christian teachings and ethics have largely focused on Christian positions as regards human relations to God.

On the basis of Western philosophical and religious traditions, which have never had deep roots in most African communities, little attention was given to issues concerning the relations between human and non-human beings on earth. According to Mkhize (2008:40), this contradicts the African reality of harmonious living between God, humans and the rest of the world in which they find themselves. Hence, Murove (2009a: xiv) argues that the time has come for scholars in sub-Saharan Africa to articulate the nature and form of African ethics, which is more inclusive and practical. What is called for as well is a more inclusive and integrated Christian teaching and ethics that will allow humanity to transform its relationship with other living creatures, in other words, with the rest of creation.

The existence of the Church in Tanzania, especially the Lutheran Church has now exceeded more than a hundred years. The church has been involved in addressing various issues of social concern for the past several decades where the central mission has been to enable communities to experience fullness of life in Jesus Christ (SD, 2005:1-2). Apart from the notable contribution the church has had in offering community services, such as education and health, not much has been done to expand its mission strategies to include creation care, especially in the world of agriculture.

This has been the case regardless of the fact that most adherents engage in agricultural activities for their livelihood and that in fact agriculture is a mainstay of the country's, as well as individuals' economy. Recently, an attempt has been made, especially by the Southern Diocese (SD) to establish a Centre for Agricultural Development (CAD) that will help smallholder farmers to improve their agricultural production and promote a more sustainable agriculture (SD, 2007:3-4). The fact that the CAD is established at a time when climate change has become a threat to all forms of life on earth suggests that addressing climate change through relevant agricultural approaches has to be among the priorities of the CAD. This means that an ethic of care for God's created order should govern and guide farmers' decisions regarding appropriate approaches to agriculture.

The concept of care is one of the key themes in Christian ethics and teaching at large. However, "care" has long been largely interpreted in relation to human beings. In the context of climate change, particularly in Africa, an ethic of care for creation that governs the behaviour of human beings and their interaction with God's creation is of primary importance. Accordingly, the overall problem to be addressed in this study is that, despite the increased awareness of the adverse effects of climate change exacerbated by unsustainable agricultural methods and of the need for an urgent response from all sectors, little has been done to explore ways in which an African Christian ethic of care can be further cultivated in order to guide humankind's interaction with its natural environment, for the sake of mitigating the impact of climate change. Therefore, the key research question that this study seeks to address is: *In what ways can an African Christian ethic of care be cultivated for sustainable agriculture in the context of climate change in Tanzania?*

1.2 Rationale for the present study

In theological discourse, reflections on ecotheology in general and on climate change and environmental concerns in particular, are plentiful. However, most of these reflections are western oriented, thus representing a western worldview which is mechanistic and anthropocentric in nature. More important is that, in spite of the fact that agriculture dominates the economy of most African countries, more especially in Tanzania, only a limited amount of theological reflection has engaged with, and advocated for, life-enhancing African agro-moral vision as a theological strategy and as a response to the challenges of climate change today. This is particularly true for Tanzania which is

predominantly an agricultural country with an agricultural sector that is already suffering from the effects of climate change.

The present study engages theologically with the agricultural sector and explores possible ways of cultivating an African Christian ethic of care to promote sustainable agriculture in Tanzania at a time when climate change poses already a grave threat to various forms of life on earth. In this study, the researcher argues that the anthropocentric interpretation of Christianity is problematic and has, for many years now, nurtured an unsustainable human attitude towards God's creation which has the God-given capacity to support all forms of life on earth. That this is the case in Africa is largely due to the western introduction of Christianity, disconnecting indigenous people from their traditional religio-cultural worldview which was potentially environmentally sensitive. Therefore, this study extends the boundaries of traditional Christian interpretation in general and of Christian ethics in particular. It revisits and re-envisioned Christian faith and moral formation and advocates for a more life-enhancing agriculture in order to safeguard the integrity of life and of God's creation.

1.3 Research question and objectives

As mentioned in section 1.2 of this chapter, the research problem that the current study attempts to address concerns the inadequacy of traditional anthropocentric Christian faith formation and Christian moral formation when it comes to transforming and modifying life-denying farming methods in the context of climate change. Therefore, the key research question that this study addresses is: *In what ways can an African Christian ethic of care be cultivated for sustainable agriculture in the context of climate change in Tanzania?* In order to address this key question the following sub-questions have been explored:

1. What is the state of climate change in Tanzania?
2. What factors contribute to climate change in Tanzania?
3. How do climate change and agriculture impact on each other?
4. What is the moral-theological implication of climate change in relation to the world of agriculture?
5. In what ways can an African Christian ethic of care be cultivated to enhance sustainable agriculture in the context of climate change in Tanzania?

Objectives

In the light of the research question and its sub-questions above, the following are the central objective that this study seeks to achieve.

1. To describe the state of climate change in Tanzania.
2. To articulate factors which contribute to climate change in Tanzania.
3. To demonstrate how agriculture and climate change impact on each other.
4. To discern a moral-theological implication of climate change in relation to the world of agriculture.
5. To propose ways in which an African Christian ethic of care can be cultivated for sustainable agriculture in the context of climate change in Tanzania.

1.4 The scope of the study

The study revolves around three critical issues which are relevant to the research questions: climate change, the world of agriculture and Christian ethics, with special focus on an African Christian ethic of care. Regarding climate change, the focus is on describing the geographical location of Tanzania which determines the nature of normal climatic conditions in various regions, articulating the state of climate change, and identifying factors that contribute to climate change. This study has in no way been approached from a pure scientific point of view pertaining to climate change. However, scientific studies on climate change have been consulted in order to acquire an understanding of the state of climate variability, factors that contribute to climate change, and of how climate change affects the economy of individuals as well as communities at large, thus setting a base for theological reflection (see chapters 2,3 and 4).

With regard to the world of agriculture, a central objective has been to demonstrate the conceptual link between agricultural activities and climate change. This objective has been achieved by, on the one hand, discussing the effects of modern farming methods on God's created order and, on the other hand, describing the potential of life-enhancing agriculture, as rooted in African indigenous knowledge (African agro-moral vision) and in the holistic African worldview (see chapters 3, 5 and 6). It is not the intention of this research study to deal with detailed technical aspects of agriculture and modern farming

methods. Rather, the study explores, from a theological point of view, the adverse impact of the currently dominating anthropocentric worldview and presents the possibility that a broader understanding of God's image, as embodied in humankind, could be exposed and promoted by cultivating an African ethic of care to enhance sustainable agriculture.

Finally, this study is not meant to offer a comprehensive account of Christian ethics in general. However, Christian ethics has been briefly explored in order to determine the traditionally anthropocentric nature of current Christian philosophical views and the church's resulting failure to engage with issues of climate change and environmental degradation. On this basis, the study aims to propose a mission approach and a Christian ethics which can significantly contribute to efforts to combat climate change by focusing on life-centred agricultural approaches (see chapter 7).

1.5 Significance of the study

The significance of this study lies in an increased awareness of climate problems in Tanzania, exposing the potential interface between agriculture and theological reflection in the light of climate change and in the proposed transformation of the relationship between humankind and its natural environment. In addition, the need for an enhanced human moral responsibility for the entire creation is given a central place in the study, suggesting an agro-moral-theological vision that promotes sustainable agricultural methods as a way to curb the impact of climate change in Tanzania.

1.6 Theoretical and methodological underpinning of the study

Mouton and Marais (1990:191) insist that theoretical orientation in any scientific study is critical because no scientific research exists in isolation. This means that any individual research project forms part of a particular theoretical framework that determines its operation. Thus, it is natural that, in any given field of study, knowledge represents a link to a series of interdependent earlier studies and theories. In the light of this, and given the fact that this thesis considers climate change as being related to the role of human beings in the created order (Christian ethics), the study has adopted two existing

theoretical assumptions which are a theory of ecological transformation and a theory of responsibility.

A theory of ecological transformation has been proposed by Mark Hathaway and Leonardo Boff (2010), based on the realization that the current development praxis, supported by an anthropocentric interpretation of Christianity, views God's created order as no more than a storage of resources destined for human exploitation. On the basis of this realization, ecological and contextual theological studies call for more reverence of life in its interconnected nature. Hathaway and Boff have intensively explored how ecological liberation and transformation in the context of environmental crisis and climate change can be achieved and can enhance life systems on earth. They proposed three steps towards a necessary ecological transformation: unmasking earth pathology, deepening ecological understanding (deep ecology) and renewal of the human psyche (Hathaway and Boff, 2010:9-10).

The first step, *unmasking earth pathology*, involves exposing ecological problems and analysing various factors, both systemic and individual, that lead to ecological crisis and climate change. Commenting on this principle, Wirzba (2003:54) argues that it helps not only to identify earth sickness but it also offers an opportunity to draw on some resources regarding the humankind/nature relationship that are part of indigenous knowledge. In the modern world, it may seem as though indigenous people lack the technological potential to address these issues. However, studies such as Wirzba (2003:56), UNEP (2008:33-55), Nakashima and Rove (2002:2-3), Gudhlanga and Makaudze (2012), and Nyong et al (2007:792ff) recommend indigenous knowledge for its ecological wisdom that may direct Christian faith communities towards a more loving experience of nature. Similarly, Cobb (2001:213) points out that, when considering how to respond to the ecological crisis and climate change, it is important to acknowledge that a true environmental consciousness was far more evident and effectively present in hunting and gathering societies than it is today in most modern societies.

The second principle, *deepening ecological understanding*, is about enhancing awareness of various services which can be provided only by God's created order, and that ensure the sustainability of life for all living beings. It is based on the understanding that the natural environment is a common property and that therefore human beings have a common responsibility to safeguard its integrity. For this reason, the 'father' of 'deep ecology', Arne

Naess (1984) rightly observes: “Ecological diversity enhances the potentialities of survival, the chances of new modes of life and the richness of all forms of life.” Cobb (2001:213) asserts that most of the leading world religions, Christianity included have been too anthropocentric without taking seriously the interconnected nature of life on earth. Therefore, the principle of deepening ecological understanding implies the need to modify Christian faith formation by incorporating a new awareness of the ecological crisis and climate change. Moreover, this can be done by taking seriously into account interconnected nature of all life and the comprehensive and inclusive redeeming work of God in the world.

The third principle, *renewal of the human psyche*, calls for a transformation of the human attitude towards the natural environment and the impartation of a more comprehensive worldview (cosmovision) which is all encompassing, unlike the mechanistic, deterministic, atomistic, and reductionist worldviews that today dominate humanity, resulting in the current ecological crisis and climate change (Hathaway and Boff, 2010:10). These three steps of ecological transformation interact with the theory of responsibility as advocated by H. Richard Niebuhr (1977), a moral theologian. For Niebuhr, there are four key aspects of the theory of responsibility, namely: responsiveness, interpretation, accountability and social solidarity. The aspect of *responsiveness* entails human commitment to respond to issues that threaten life, an example of which is climate change, a case in point for this study. The *Interpretation* aspect of the theory of responsibility has to do with a commitment to making judgement and decisions regarding various activities. Such judgement and decision making must be informed by the human intelligence and skills that identify, compare and analyse what is happening in a particular context. An aspect of *accountability* centres on issues of interaction and relationship. It is a commitment to account for one’s action and behaviour (Niebuhr, 1977:121). Finally, *social solidarity* as an aspect of the theory of responsibility suggests the communal response to issues that are happening in the community. On the whole, the theory of responsibility calls for individuals, communities and institutions to ensure that responsibility characterises all domains of life: family, economic, political, cultural life, social and environmental life (Niebuhr, 1977:122-123).

Niebuhr proposed this theory because he found that the current popular theories of ethics i.e. *teleology*, *deontology* and *virtues*, are not sufficiently effective in the formation and determination of human moral behaviour. This is especially the case when placed in the

context of ecological crisis and climate change in which moral aspects are engraved. Niebuhr (1977:116) stated, for instance, that a teleological theory of ethics seeks to interpret moral life in terms of the goal of human behaviour and the consequences of human choices. In other words, teleological ethics looks at what happens, or will happen, following an action which is considered to have a moral dimension. This, therefore, suggests that an action may be morally good if it has a desirable outcome. A deontological theory of ethics seeks to understand morality as a matter of timeless rules and strict compliance with law and regulations. In this way morality becomes a principled obedience or legal conformity to the dictates of laws and reason.

In H. Richard Niebuhr's view, these ethical theories lack a comprehensive nature. Therefore, he suggests a theory of responsibility. To be responsible, H. Richard Niebuhr (1977:121) argues, is to be able to account for something. Thus, theory of responsibility is something that gets placed in the context of social relationships. In this sense, a theory of responsibility implies a trusteeship over things that belong to common life and that serve the common good. In his book, *The Responsible Self*, H. Richard Niebuhr (1963:73) insists that the individual self is born in the womb of society. The social self does not exist on its own, but rather lives in a responsive relationship with others. Schweiker (1997:9) and Burtness (1985:64) contend that human beings are always involved in some sort of responsibility. This shows that human beings were created to be responsible within the community. Le Bruyns (2009:23) correctly in support of Niebuhr's formulation argues that naturally, human beings have been entrusted with power from God which cannot be used for personal advantage, but rather for the common good of all.

Niebuhr (1968:20) argues further, that unlike traditional Christian ethics which focuses on the individual's desired ends, responsibility stands as a symbol that represents an alternative or additional way of conceiving and defining human existence. Taking into account the current degradation of the created order, Villa-Vicencio (1994:86) points out that an ethic of responsibility calls upon humanity to act responsibly in the service of the other. Taking this point further, Bonhoeffer (1968:41) infers that the concept of responsibility has the potential to promote commitment to any kind of transformation, including ecological transformation. Embedded in the concept is devotion to truth, goodness, justice and well-being for all.

1.7 Integrating theories into the logic of the study

According to Mouton and Marais (1990:191), the mechanical or technical description of existing theory is not enough in a scientific study. Theoretical assumptions must be integrated into the logic of a research project. In the case of the present study, the applicability of the three steps of ecological transformation and of the theory of responsibility lies in their emphasis on the interconnected nature of all life, which goes beyond a traditional Christian anthropocentric interpretation. They provide an insightful and incisive framework for analysing issues of climate change, moral responsibility and systems of ethics that are inclusive. It also allows for responses to climate problems and for propagating a life-centred agriculture. The two theories thus have informed and guided this study in its articulation of adverse effects of the present anthropogenic environmental crisis.

On the one hand, the theory of ecological transformation offers a substantial re-orientation of human civilisation towards its natural environment. On the other hand, the theory of responsibility insists that the human and the natural world are partners in the sustaining of life on earth. Therefore, there are two reasons why a theory of ecological transformation and the theory of responsibility together form a relevant theoretical orientation for this study. Firstly, both pay particular attention to the recognition of the interconnected nature of life on earth and to the need to re-visit human moral formation in order to transform attitudes towards those issues that are crucial for the sustainability of life. Secondly, both theories emerged in the context of an anthropocentric interpretation of Christianity and in the relationship between humankind and the rest of the created order. Given that the focus of this study is to explore ways in which an African Christian ethic of care can be cultivated for sustainable agriculture in the context of climate change and stimulate a sense of moral responsibility for God's creation, the two theories, in interaction with each other, have guided the present study to achieve its purpose in the following manner.

During this study, the first step to attain ecological transformation (namely *unmasking earth pathology*) has made the researcher become aware of the magnitude of climate change through the analysis of various discourses on the phenomenon and of general

contributing factors, with a special focus on agriculture in Africa and Tanzania in particular. Thus, this principle has facilitated an attempt to address research questions 1, 2 and 3 of this study.

In the course of this study, the second step of ecological transformation (*deepening ecological understanding*) together with the theory of responsibility have interacted each other to assist the researcher in analysing moral-theological implications of current climate change situation. Special attention has been given to the ways in which theological reflection has played an ambiguous role of being both a problem and promise for the context of climate change and environmental crisis. Also, the study has presented agromoral-theological vision rooted in African indigenous knowledge as resource for promoting sustainable agriculture and curbing the problem of climate change hence addressing research question 4.

The third step of ecological transformation (*renewing the human psyche*) and the theory of responsibility have worked together leading the researcher to explore ways in which an African Christian ethic of care could be cultivated in order to transform human's ways of thinking about God and the world, thus enhancing sustainable agriculture and curbing challenges of climate change and environmental degradation. This has provided the basis for dealing with research question 5.

1.8 Research design and methodology

1.8.1 Research design

In order to understand the impact of human activities on God's created order in the context of climate change, and in order to explore a possible cultivation of an African Christian ethic of care to enhance sustainable agriculture, qualitative approaches, especially descriptive design and interpretive strategies, were incorporated in the research process. According to Kombo and Tromp (2009:71), and Kothari (2009: 34), descriptive design and interpretive strategies in qualitative research aim to describe and interpret phenomena as they exist as well as determining reasons for their existence.

The study involves three key aspects: climate change, the world of agriculture and Christian ethics, with special focus on an African Christian ethic of care. The aim is to present an overview of the climate change discourse, its impact on agriculture and the influence of trends in theological thought on creation and environmental problems, while exploring the potential of an African Christian ethic of care to stimulate humankind's moral responsibility for nature and to promote sustainable agriculture in the context of climate change.

The research has employed a qualitative approach because scholars such as Keith (2009), Kelly (2006) and Creswell (2009) point out that qualitative research is the strategy known to be appropriate for studies that seek to understand a particular phenomenon from the perspective of a specific context. This approach is especially relevant in obtaining information about values, opinions, behaviour and the social context of a particular community. Given that the nature of this study involves exploring and articulating human interaction with the natural environment at a time of climate change, a qualitative approach is critical because it is capable of providing information about human aspects of the issue in question.

Furthermore, the suitability of this approach for the present study lies in its effectiveness in identifying some of the less tangible factors that influence human behaviour and attitudes towards the natural environment, such as social norms, socio-economic status, religion, and the nature of the existing human relationship with the physical environment (Keith, 2009:112; Creswell, 2009:18-19). In addition, the validity of this approach for the current study is based on the fact that the findings from qualitative data relating to certain groups can easily be extended to other people or communities with characteristics similar to those of the subject of the study. As the challenges, posed by climate change, call for a reconsideration of humankind's moral and practical attitudes towards the natural environment and, hence, for a revised moral formation stressing ecological responsibility, the qualitative approach used in the study allows for its findings to be adopted in other geographical areas with characteristics similar to those of Tanzania.

1.8.2 Research Methodology

As discussed above, the study has employed qualitative strategies with descriptive and interpretive dimensions which permit the collection of detailed information relevant to the study. Data collected from various sources have been subjected to a contextual interpretation to fit the context of Christian faith communities in Tanzania, with special reference to the Lutheran church and the Southern Diocese in Tanzania.

1.8.3 Methods of data collection

As stated earlier, the key question addressed by the present study is: *In what ways can an African Christian ethics of care be cultivated for sustainable agriculture in the context of climate change in Tanzania?* In order to obtain relevant information, three methods of data collection have been deployed, which are critical analysis of the existing literature, archival search and document analysis.

1.8.3.1 Critical analysis of existing literature

In the research process, literary research focuses on literature, relevant to the theoretical and methodological underpinnings of the study. It also deals with the analysis of existing scientific studies on key issues relating to the study, namely: an overview of climate change, the world of agriculture and moral-theological considerations, with special focus on the African Christian ethic of care for God's creation through agricultural activities. During this process, a gap in the available body of knowledge was identified, the closure of which the present study attempts to contribute to. The critical analysis of the existing literature has provided material that was relevant to a logical approach to the research question. In this regard, the UKZN Library (especially the main Library in Pietermaritzburg Campus), the Lutheran Theological Institute-LTI Library (One of the cluster Libraries at the Lutheran Theological Institute), online websites and Njombe District Library services (Tanzania), were extensively consulted and provided the necessary information relevant to this study.

1.8.3.2 Archival search and document analysis

The ELCT-SD archive located in Kidugala Lutheran Seminary was of great help in obtaining information relevant to the research. Minutes, policies and documents of the church in general and of the Southern Diocese in particular, present in the archive, were examined. The objective was to study church resolutions on various aspects of the church mission, its involvement in issues that affect the sustainability of life, and to find out whether or not there had been any deliberations on climate change and the environmental crisis in relation to the world of agriculture (see chapters 3 and 7).

The researcher also conducted a critical review of the current church document featuring the Christian moral formation process, exploring the extent to which issues of climate change and safeguarding the integrity of life systems (God's creation) have been factored into the process of Christian formation. Further, Sunday school, primary school, confirmation and secondary school religious teaching materials(documents) were also examined in order to find out whether or not such teaching materials are potentially useful for an ecological Christian and moral formation leading to an earth-keeping community (see chapter 7).

1.8.3.3 Analytical tool deployed in this study

According to Dey (1993:31), qualitative data analysis is a process of breaking down the vast amount of data collected from different sources into its constituent components in order to discover its characteristic elements, structure, relationships and meanings in the light of the subject under study. Therefore, the present research has adopted the interpretive method as an analytical tool. It has been used throughout the study. Huberman and Miles (1994:8-9) identify three major approaches which are commonly used by researchers for qualitative data analysis: interpretive approach, social anthropological approach and collaborative social research approach. Of these approaches and for the sake of this study, the interpretive approach was adopted and has offered the researcher the opportunity to view social action and human activities as texts that call for a proper contextual interpretation. It means that human activities are seen as a collection of symbols that have meaning and significance in individual lives as well as in

the global community. Interpretive analysis has two main components: the meaning and significance of a particular phenomenon (Auerbach and Louise, 2003:43). Whereas an exploration of the meaning of a phenomenon involves causes, its significance lies in the effect of the phenomenon on individuals and the community as a whole. The interpretive method of qualitative data analysis has been appropriate for this study which seeks to explore ways in which an African Christian ethic of care can be effectively cultivated to enhance sustainable agriculture in response to climate change.

In the process of analysing data collected during the research, the following steps have been followed. The first step was to describe the context of the study in relation to climatic conditions. In this regard, Dey (1993:33) emphasizes that giving a brief account of the context of the study has increasingly become an important aspect of qualitative studies because it provides an opportunity to situate the phenomena under study into their specific background and thus the study gets a wider social, economic, political, cultural and historical significance. This is so, because context is central to determining the meaning of a particular phenomenon. A proper understanding of the context facilitates the correct presentation of the meaning. This particular step in the data analysis process, coupled with the first principle of ecological transformation *i.e. unmasking earth pathology*, was accomplished in chapter two where the geographical location and the socio-economic and climatic conditions of Tanzania are discussed (see chapter 2).

The second step in the process of analysing data was an in-depth description of the phenomenon under study. Dey (1993:31) argues that such a description aims at providing detailed information about the state of the debate on the phenomenon from various perspectives. In this process, much emphasis is placed on describing the world as perceived by different stakeholders while exploring the way that they define their situation and the various motifs that control human actions and behaviour/attitudes (Dey, 1993:37). Thus, employing the second principle of ecological transformation *i.e. deepening ecological knowledge*, a detailed discussion of the interplay between agriculture and climate change has been presented whereby also the influence of religion in this regard, especially Christianity, was also critically considered (see chapters 3 and 4).

The third step in the analysis of data for this study is initiating a process leading to changed human attitudes towards God's created order in relation to the world of

agriculture. Dey (1993:38) points out that the aim of this step is to shed light on ways through which humankind can collaborate to either sustain or change the current situation. On this basis, the interpretive method of analysis led to a call for the transformation of human attitudes towards nature and emphasised an agro-moral vision as an appropriate theological response to climate change. In the African context, especially in Tanzania, such moral theological vision must be rooted in the African wisdom which can be harnessed from some of the potential African indigenous ecological knowledge. This aspect in the process was integrated with the third principle of ecological transformation i.e. *deepening ecological knowledge* and *theory of responsibility* (see chapters 5 and 6).

The last step in the analysis of data for this study was to make a connection between safeguarding the integrity of creation through farming practices and the mission of God on earth, in which the church is one of the key players. Dey (1993: 48) contends that presenting the context of the study, describing the phenomenon under study and initiating the process for transformation are not an end in themselves. Rather, the overriding purpose of these steps is to suggest new ways through which a true transformation can be realised.

The first three steps of analysis are like creating the building blocks that must be brought together strategically and connected by mortar in order to produce a healthy building. For this study to bear fruit, the proper cultivation of an African Christian ethic of care for sustainable agriculture requires the recognition that climate change and its effects are a concern for Christian faith, church mission and pastoral care. This means that care for the creation must be given a central place in church activities, leading to the formation of an earth-caring community (see chapter 7).

1.9 Chapter summary

This chapter was set out to present a general introduction of this study which seeks to explore ways through which an African Christian ethic of care can be cultivated to enhance sustainable agriculture in the context of climate change in Tanzania. In this process, the chapter has outlined background information and identified the research problem. Furthermore, rationale for the study, research questions and objectives, significance of this study and theoretical and methodological underpinnings of this study have been well articulated leading to chapter two, which sets the context of this study.

CHAPTER TWO

CLIMATE CHANGE, WORLD OF AGRICULTURE AND THE CHURCH IN TANZANIA

In some ways, what is imperative at this time is for people to remember and recognise the intimate and immediate connection in our world: the connection between religion and environment, between social ethics and civic action, between interfaith cooperation and climate action, and especially between ecological pollution, economic expansion and social fairness.

(His all-Holiness Ecumenical Patriarch Bartholomew 2014)

2.1 Introduction

In chapter one, it was stated that the central question which this study seeks to address is: *In what ways can an African Christian ethic of care be cultivated for sustainable agriculture in the context of climate change in Tanzania?* Furthermore, chapter one offered an overview of the process (design) that this study has adopted in an attempt to address this key research question. Chapter two contributes to finding a response to this question by addressing sub-question one and two in three ways. Firstly, the chapter briefly discusses the socio-economic background of Tanzania in relation to climate change while demonstrating the link between climate change and the world of agriculture. Secondly, the chapter gives an overview of climate change while highlighting factors that contribute to climate change in Tanzania. Thirdly, the chapter goes on to highlight the existence of the church in Tanzania with special focus on the Evangelical Lutheran Church in Tanzania (ELCT) Southern Diocese (SD) and the way that the church has responded to challenges of climate change, considering the dominant role that agriculture has in the lives of Tanzanians. The general purpose of this chapter is to demonstrate the relationship between climate change, the world of agriculture and the mission of the church in Tanzania while articulating some ethical questions about people's lives, actions and moral decisions in the household of God (the earth). In other words, chapter two begins to address the key question of this study by laying bare the earth pathology in Tanzania, in accordance with the theoretical framework that guides this study.

2.2 Tanzania's geographical location

The United Republic of Tanzania (URT) was born in 1964 as the result of a union of two, at the time of independence, countries known as Tanganyika and Zanzibar (Bezabih, Chambwera and Stage, 2010:3). In the process of colonial exploration of Africa and the establishing of colonies, Tanzania fell into Germany dominion in 1886 but was, after World War I, handed over to British colonial rule (URT, 2011a:5). Tanzania is located in East Africa and is one of the member states of the current East African Community (EAC). It is situated between latitudes 1° and 12° south of the equator, and between longitudes 29° and 41° east of Greenwich, with an area of 942,784 square kilometres. About 61, 465 square kilometres of this area consists of stretches of water, including parts of the three great lakes of East Africa: Lake Victoria, Lake Tanganyika and Lake Nyasa (Mwandosya and Meena 1999:1; Shayo 2006:1 and Agrawala 2003:8). Tanzania is the largest of the East African Community member states. Geographically it is characterised by plains along the coast, a central plateau and highlands in the north and south. The elevation ranges from sea level to the highest point of Africa, namely the glaciated peak of Mount Kilimanjaro, standing at 5,895 metres. Mount Kilimanjaro's expansive slopes constitute one of the unique ecosystems of Africa (Agrawala, 2003:8-9).

Furthermore, the eastern boundary has an 800 kilometre long coastline stretching along the Indian Ocean from Kenya in the north to Mozambique in the south. About 40 kilometres offshore are the islands of Zanzibar (Unguja, Pemba and Mafia) and a number of other smaller Islands. With the exclusion of the coastal belt, most parts of the country share the general characteristics of those parts of the central African plateau that are between 1000 – 3000 metres above sea level with gentle sloping plains and plateaus, scattered hills and low-lying wetlands (Shayo, 2006:1). In the south, Tanzania is bordered by Mozambique, Malawi and Zambia. Zaire, Burundi and Rwanda share borders with Tanzania in the west, Uganda and Kenya in the north, with the Indian Ocean in the east (2011b:6). On the whole, this geographical background is the reason for the nature of local climatic conditions. These vary considerably, due to the fact that Tanzania is home to both the highest and the lowest points in the African continent, as discussed in more detail in section 2.3 of this chapter.

2.3 Tanzania's socio-economic situation

The major political instrument for socio-economic development in Tanzania is the National Strategy for Poverty Reduction and Economic Growth (NSPREG), popularly known in Swahili as *Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania* (MKUKUTA). It is a central government program that aims at enhancing good governance and reduces poverty by stimulating (shared) growth, a high quality of livelihood, peace, stability and unity, combined with quality education and international competitiveness, all of this as part of the National Development Vision 2025. Since 2000 Tanzania has been consistently registering an economic growth rate of above five per cent - higher than its average of three per cent growth in the 1990s (Stiftung, 2010:20). However, according to the CIA (2011:4) and URT (2011a:17), Tanzania is among the world's least developed countries with a GDP of \$ 500 per capita, although it has an emerging economic growth potential, especially in the industrial and service sectors. There is little progress in rural areas because of a relatively slow growth in the agricultural sector.

Furthermore, the current socio-economic situation in Tanzania cannot be properly understood without taking the country's post-independent efforts into account. For more than 20 years Tanzania was led by *Mwalimu* (teacher) Julius Nyerere, its first president. In this period the main developmental drive was geared towards a version of African socialism [*Ujamaa*] (a concept well known in the Tanzania context signifying a life vision that gives priority to the common good of all). Such vision involved enforced "villagelisation" of previously scattered farm homesteads, comprehensive controls on the agricultural market and prices, and nationalisation of agricultural estates, industries and service sector enterprises. Hence, Tanzania has, since its independence, been involved in continuous efforts to achieve its overall development goal of improving the quality of life of Tanzanians through economic growth and poverty reduction. To arrive at this end, Tanzania has adopted three different policy frameworks in three different periods, respectively.

The achievement of independence was the first vision for national development as it is always believed that freedom is a key to any socioeconomic development. It became however clear that not all people understood the consequences and the obligations that came with living in a post-independent nation which required hard work in order to

effect national development. In order to create awareness in this regard, the post-independence catchword became: *uhuru na kazi* (freedom and work) (URT, 2000:7).

A second framework, introduced to advance the country's development policies, was known as the Arusha Declaration. It articulated a national plan for socio-economic liberation, based on *Ujamaa* and the vision of self-reliance as a long-term goal. As it had not taken account of the dynamic character of politics, the complex nature of the developmental process and the incentive structures needed to make it effective, this vision could not yield much success, however.

The third national policy framework is the current National Development Vision 2025. This vision intends to arouse Tanzanians to making great efforts and harness these efforts and the available resources towards attaining a better standard of life and provide the country with the capacity to withstand the intensive global economic competition (URT, 2000:2). On the whole, this vision strives to build a nation based on the following key attributes: a high quality of life (reverence of life), good governance, an educated and learning community, and peace, stability and national unity among the citizens. Due to the fact that agriculture is the key sector for socio-economic advancement in Tanzania, the realisation of 'vision 2025' depends to a large extent on how much effort is invested in transforming farming practices in the current context of climate change. On the basis of this realisation, it is envisaged that agriculture will be modernised, commercially oriented, highly productive and profitable while utilising natural resources in an overall sustainable manner and act as an effective basis for inter-sectoral linkages by the year 2025 (UTR, 2009:10).

The Tanzanian economy largely depends on the following seven key sectors: agriculture, mining, tourism, industry, energy and wildlife, forestry and marine and coastal resources. Agricultural production includes crops such as coffee, sisal, tea, cotton, pyrethrum, cashew nuts, tobacco, cloves, corn, wheat, cassava, bananas, fruits, vegetables, cattle, sheep, goats etc. Industry, on the other hand, is mainly centred around the processing of agricultural produce (sugar, beer, cigarettes, sisal, and wine), mining (diamond, gold and iron), the production of salt and the production of cement, oil refining, and the manufacture of shoes and fertilizers (CIA, 2011:6) and (Shayo, 2006:2).

Explaining this further, Agrawala (2003:10) asserts that taking a close look at the Tanzanian national economy it becomes clear that it depends mainly on the agricultural sector. This means that agriculture is practiced in every part of the country, forming the basis for both the micro- and the macro-economy. Furthermore, agriculture accounts for nearly half of the national GDP, employs about eighty per cent of the work force and provides eighty five per cent of the export volume (Agrawala, 2003:11; URT, 2007:1 and Sarris, Savastano and Christiaensen, 2006:2).

Explaining further the significance of Agricultural sector in Tanzania, the Permanent Secretary of the Ministry of Agriculture (URT, 2008) infers that apart from its contribution to the general national economy, Agricultural sector serves as a key instrument and pillar in various aspects. For example, the agricultural sector stands at the centre of poverty reduction strategies, addressing food security issues, as well as achieving Millennium Development Goals (MDGs). Although other sectors such as minerals, tourism and service sector have recently recorded significant growth rates, the contribution of Agricultural sector has remained constantly immense, standing at five percent per annum for the past decade (URT, 2008:3).

Moreover, the paramount importance of the agricultural sector is reflected by the fact that more than eighty percent of the total population of the country relies on agriculture for their livelihood, either directly or indirectly. That agriculture is the basis of the national economy is true, not only for Tanzania but for most countries in Africa, especially the sub-Saharan region. In this regard, the African Development Forum (ADF, 2010:5) has stated that farming is the backbone of the rural economy of Africa and is practised by sixty percent of the African population, while agricultural production constitutes fifty percent of the total export volume and twenty percent of continental GDP. Extending this point further, Blanca et al. (2011:19), argued that agriculture constitutes the mainstay of most African economies as it is commonly the largest contributor to GDP, while about two-thirds of manufacturing is based on agricultural raw materials. More importantly, the agricultural sector remains the main source of employment and is most critical for pro-poor economic growth in the majority of African countries. With agriculture supporting between seventy and eighty percent of the entire population in sub-Saharan Africa, one may conclude that rural development, health and incomes depend on a viable agricultural economy.

In a further comment on the importance of agriculture in the Tanzanian economy, Tanzania National Business Council-TNBC (2008:25) points out that the future economy of Tanzania depends on the agriculture sector since not a single country in the world has achieved a significant measure of socio-economic and structural transformation without the transformation and development of agriculture. However, such agricultural development needs to be sustainable and life-enhancing, that is, it must take seriously the management of ecosystems, which support agricultural production.

Furthermore, there is no country in the world that has succeeded in eradicating abject poverty without raising its agricultural production and doing so in a sustainable manner. It is for this reason; argue Mapolu and Phillipson (1984) that, since independence, the Tanzanian government has stressed the importance of the agricultural development sector in rural areas. The emphasis was on increasing production and living standards in rural areas by improving farming practices, i.e. by making efforts to gradually raise agricultural output within existing rural households through an extension services. Another way of increasing agricultural production was through resettlement in pre-selected villages which would engage in special schemes, introducing modern farming methods under the supervision and direction of government officials.

Mwalimu Nyerere (1967:13), the first president of Tanzania, highlighted the importance of the agricultural sector for the Tanzanian people and the Tanzanian economy at large when he said:

Because of the importance of agriculture in our development, one would expect that agriculture and the needs of agricultural producers would be the beginning and central reference point of all our economic planning. Instead, we have treated agriculture as if it was something peripheral or just another activity in the country, to be treated at a par with all the others and used by others without having any special claim upon them. We have neglected agriculture. If we are not, every ministry without exception and every Parastatal and every party meeting would be working on the direct and indirect needs of the agricultural producers... We must now stop this neglect of the agriculture. We must now give it the central place in all our development planning. For agriculture is indeed the foundation of all our progress.

This remains an essential truth today. It is clear from this brief discussion that the importance of agriculture in consolidating the national economy and in sustaining the lives of many in Tanzania cannot be overestimated. As has been indicated in the above quote, in view of the critical role of the agricultural sector, all stakeholders should place

agriculture at the centre of their development strategies. Given this importance of agriculture which, according to Wibberley (2006:1), is founded on two central processes of nature - photosynthesis and decomposition - it is worthwhile at this point to look briefly at climatic conditions in Tanzania that support or affect agricultural production. This will - as is discussed in the following section - assist at a later stage to understand the effect of climate change on the natural climatic conditions in Tanzania.

2.4 The nature of climatic conditions in Tanzania

Tanzania hosts a variety of ecosystems, two of which are predominant: aquatic and terrestrial systems (Devisscher, 2010:1). Whereas the aquatic system is made up of freshwater, wetlands, the coastal and marine strips, the terrestrial system embraces forests, savannah, dry lands or deserts and mountains. Most of these are trans-boundary such as the Lake Tanganyika ecosystem, which is shared by four countries. These ecosystems provide series of resources which either directly or indirectly support the livelihoods of the human population and much of the country's socio-economic advancement (Devisscher, 2010:3). This implies that resources and services provided by these two major ecosystems play a significant role in the well-being of human society. According to the Millennium Ecosystem Assessment (MEA, 2005:6), the services provided by these ecosystems can be divided into four main categories: *service provision*, *regulating services*, *cultural services* and *supporting services*.

In the first place, ecosystems play a role as service providers to all living beings. These services include the production of basic goods such as crops, livestock, drinking/washing water, industry, hydro-power and irrigation. Other services include pasture, timber, biomass fuel, fibres (cotton and wool), minerals for energy, construction, transport, wild plants and animals used as sources of food and for hides, building materials, medicines etc.

The second category, in addition to the provision of these services, includes the regulatory services which ecosystems also offer. These are the benefits, resulting from the ways in which ecosystem processes affect both the physical and biological environment. Most of these are related to water storage, flood protection, coastal/tsunami protection and regulation of air and water quantity and quality. Others are regulation of water flow, absorption/biodegradation of wastes, absorption of carbon dioxide, control of disease vectors and regulating climate (MEA, 2005:7).

Thirdly, next to provisioning services and regulating services, ecosystems offer benefits of cultural services as well. These cultural services are benefits of a non-material kind – especially spiritual enrichment - that living beings derive from ecosystems, through recreation, tourism, outdoor related sports, education, heritage and aesthetic enjoyment. There are societies whose cultural identities and religions are closely tied to particular habitats or wildlife of this nature.

Fourthly, there are also supporting services obtained from ecosystems. These services are critical for the production and maintenance of the three previously mentioned categories of ecosystem services. They are linked to the water cycle, nutrient cycling, and the production of atmospheric oxygen, soil formation and the primary production of biomass through plant photosynthesis (MEA, 2005:7-8). It is, therefore, clear that any human intervention – for example demographic or socio-economic changes involving dominant patterns of transformation - can affect sustainable provision of these services, which in turn leads to changes in human well-being.

In line with these services, there are a number of determinants of well-being of humans, as well as other living beings. MEA (2005:5) outlines some of these key determinants. The first determinant of well-being is security, which has to do with the ability to live in an environmentally clean and safe shelter, reducing one's vulnerability to ecological shocks and stress.

The second determinant has to do with the basic material requirements for a good life, which entails the ability to access resources and to gain an income sufficient for one's livelihood. In this context it should be noted that degraded ecosystems cannot continue to play their roles as providers of a range of services for the benefit of living beings. Health, materials, social relations, freedom and the possibility to make choices required for the flourishing of living beings will be affected.

The third determinant is the health aspect, involving a number of requirements, such as the ability to access adequate food and sufficient clean water for drinking and washing, to keep free from avoidable disease, to live surrounded by clean air and with energy to keep warm or cool.

The fourth determinant concerns good social relations, providing an opportunity to express aesthetic and recreational, as well as cultural and spiritual, values associated with ecosystems. It also involves the possibility to observe, study, and learn about ecosystems.

All of these must be guided by a responsible handling of freedoms and choices. It is obvious that ecosystems involve a dynamic and complex relationship between all living beings affecting each other (MEA, 2005:6).

On the basis of the two major ecosystems (aquatic and terrestrial) discussed above, Shayo (2006:1) points out that Tanzania can be divided into four climatic or topological zones. These include the low land coastal zone, the highland zone, the plateau zone and the semi desert zone. The lowland coastal zone involves three sub-zones:

The first is the wet zone, with 0 to 500 metres elevation, which receives an annual average of 1800mm rain.

The second is the humid sub-zone, with an elevation ranging between 500 and 1000 meters, with an annual rainfall of between 1000 and 1800mm.

The third is the drier sub-zone, at about 1000 metres altitude, where the rainfall is less than 1000mm per annum.

The highland zone refers to areas that have a generally high annual precipitation. These include parts of the North-eastern highlands such as the Usambara Mountains, Mt. Kilimanjaro and Mt. Meru, as well as parts of the Southern highlands such as Mt. Rungwe, the Livingstone ranges and Mt. Mbeya.

In the plateau zone, furthermore, there are dry areas that have an average rainfall of up to 1000mm per annum. Areas of this nature are found around Lake Victoria of north-western Tanzania and are covered with *miombo* woodlands.

Finally, there is a semi-desert zone mainly found in Central and North-eastern Tanzania around Dodoma, Shinyanga, Arusha, Mwanza and Mara. These areas have a rainfall of less than 600mm per year (URT, 2010:9). Clearly, the natural climate of Tanzania varies from one place to another, in accordance with geographical location, altitude, relief and vegetation cover.

Regarding general climatic conditions in Tanzania, Mwandosya and Meena (1999:3) maintain that these are largely influenced by the location of Tanzania in relation to the equator, the impact of the Indian Ocean and its physiogeography. In 2009, the Ministry of Agriculture, Food Security and Cooperatives conducted a study on “Investment potential and opportunities in the agricultural sector” (URT, 2009; URT, 2010:9-10),

where it was highlighted that, given its geographical location and set up, Tanzania has a predominantly tropical climate with some isolated highlands having a typical temperate climate. In this context, average temperatures in Tanzania range from 10°C to 35°C, depending on altitude and season, but the weather is normally cool from the end of May to the end of August. Categorically, in the highlands of Tanzania, temperatures are on average around 10°C and 20°C during the cold and the hot season respectively. The hottest period is in general between November and February when the temperature rises to between 25°C and 35°C, while the coldest periods occur between May and August with temperatures from 15°C to 20°C (URT, 2009:6-7; URT, 2010: 10).

These climatic zones show that Tanzania has a much diversified climate and varied types of soil throughout the country. Different levels of fertility determine the types of crops grown in various regions, based on the nature of the parent rock and its position in the landscape (URT, 2009:7). Because of this diversified climate, maintain Shemdoe (2011:13) and URT (2009:8) in Tanzania, there are seven agro-ecological zones where agricultural activities are carried out.

1. This zone is known as northern zone, which includes the Arusha, Kilimanjaro and Manyara regions. Given the volcanic nature of the soil, the popular crops grown in most of these regions are coffee, banana, beans, tea, vegetables, flowers, wheat, sugarcane, maize and sisal (Shemdoe, 2011:13).
2. The southern agro-ecological zone covers regions of Mtwara, Lindi and the Tunduru district where the dominant soil textures are sandy, heavy clay with low and medium levels of fertility. Major crops grown in these areas are cashew, sesame, cassava, sorghum, groundnuts, paddy, pigeon peas, cow peas, coconuts and finger millet (URT, 2009:7).
3. The southern highland agro-ecological zone involves regions such as Iringa, Mbeya, Rukwa and Ruvuma where the soil varies from clay of between low and moderate fertility, to a heavy soil texture of fertile volcanic ash. This kind of soil is suitable for crops such as coffee, tea, round potatoes, banana, beans, vegetable crops, flowers, wheat, barley, maize, paddy and sunflower (URT, 2009:7).
4. The central agro-ecological zone involves the regions of Singida and Dodoma whose soil is largely sandy and loamy, low in fertility with seasonally waterlogged

or flooded clays. Crops grown in these areas include vines, maize, beans, wheat, rice, tobacco, sunflowers, cotton and groundnuts.

5. Western zone extends in the regions of Tabora and Kigoma. These consist of predominantly sandy and loamy upland soil and of seasonally or permanently waterlogged clays. Crops that dominate these areas are bananas, maize, beans, palm oil, coffee, cassava, paddy and tobacco (Shemdoe, 2011:13).
6. Lake Zone constitute agro-ecological zone that embraces regions of Mwanza, Kagera, Mara and Shinyanga where the dominant soil is sandy and loamy with clay in some areas and with a high to moderate fertility level. Crops such as paddy, maize, beans, coffee, bananas, tea, sugarcane, vegetables, cotton, cassava, sorghum millet and sweet potatoes are popularly grown in this zone.
7. Finally, eastern agro-ecological zone covers areas of Tanga, the coast, Dar es Salaam and Morogoro. They are mainly characterised by sandy and heavy textured clay soil with low to medium fertility levels. Here sugarcane, coffee, tea, sisal, bananas, vegetables, cotton, maize, cassava, paddy and coconuts are dominantly grown (URT, 2009:8-9).

As the different agro-ecological zones and their production suggest; food crops account for sixty per cent of the agricultural GDP whereas cash crop production accounts for only ten per cent. Moreover, maize is seen as the most important food crop, representing about twenty per cent of the total GDP (URT, 2009:9).

As has been alluded earlier in this chapter, food crops and cash crops together account for more than seventy per cent of the rural economy in Tanzania, as it does in other African countries. Given the significant role that agriculture can play for socio-economic development and the sustainability of life on earth in general and Tanzania in particular, and, given the serious challenge posed to agricultural performance by climate change, it is an urgent need for all sectors of life to work together towards life-enhancing agriculture.

2.5 Public debate on climate change and the world of agriculture

Reflecting on the issue of climate change, Tobin (2009:4) concedes that humanity is by nature both a cause of, and the solution to, the problems of environmental degradation

as well as climatic variability. Human beings through various economic activities, especially agriculture, have exploited the natural environment, which has worsened climatic conditions that negatively affects various forms of life on earth. Developing this viewpoint further, Hathaway and Boff (2010:5) have argued that since the 1950s the intensity of exploitation and ecological destruction has increased dramatically in many ways as they state:

We have destroyed nearly half of the earth's great forests, which serve as the lungs of our planet. Many of the most important and extensive forest - including great boreal forest, temperate rain forest and tropical rainforest - are still experiencing an accelerating rate of destruction.

Explaining the seriousness of climate change, Hathaway and Boff (2010:5) further add:

We have released immense amounts of carbon dioxide and other greenhouse gas emission into the atmosphere, initiating a dangerous cycle of global warming and climatic instability. Global temperature has already raised an average of 0.5°C percent and may rise between 2 and 5°C over the next 20 years. We have created a gigantic hole in the ozone layer, the protective skin of the planet that filters out harmful ultraviolet radiation, hence threatening the health of many living organisms.

On the basis of this quote, it is clear that an unsustainable human relation to the natural environment, particularly in the world of agriculture, has not only resulted in a degraded environment, but also contributes hugely to the climate change which puts life on earth under a serious threat. Hathaway and Boff (2010:5) further continue:

We have seriously undermined the fertility of the soil and its capacity to sustain plant life: 65 percent of the once-arable land has already been lost, roughly half of this in the past decade, and a further 15 percent of the planet's land surface is turning into desert. Earth has lost a quantity of topsoil equivalent to that, which covers all the cultivated land in France and China combined. Two thirds of all agricultural land has been severely degraded through erosion and salinisation.

Concurring with Hathaway and Boff, Bohlin (2009:2) summarises six principal indicators of environmental degradation that results in climate change.

1. At an ever-increasing rate wilderness is converted into agricultural land and agricultural land is taken over by urban areas.
2. As many as three plant species become extinct per day. Once a species has disappeared, it is gone. Neither the species nor the role it occupies in the ecosystem can be retrieved.

3. Land continues to be degraded by the use of pesticides, herbicides and fertilizers. Fourthly, the treatment of hazardous chemicals and wastes continues as an unsolved problem. Hazardous chemicals seep into water sources from where they were dumped or buried.
4. The pollution is rapidly becoming a global problem.
5. The atmosphere appears to be changing. It is warming due to the increase of gases such as carbon dioxide from burning fossil fuel.
6. There is the loss of experience of cultures that have lived in harmony with the creation for centuries. All these are signposts of climate change as a human-induced problem.

Concerning human-induced climate change, Abraham (1991:79) further asserts that the situation of climate change has worsened, as a result of the ideology behind scientific and technical progress in the modern world. This ideology places human beings above the natural environment. On the basis of this ideology the physical environment merely consists of raw material that has to be manipulated to provide opportunities for humankind. While all this indicates the seriousness of the problem, Conradie (2011b:47) shows clearly that the victims of environmental degradation and climate change are the same as the victims of socio-economic injustice. It means that, if the current economic system continues to encourage people to ruin their natural environment for personal gain, climate change becomes a systemic problem. It is clear, that environmental degradation in the long run affects production negatively and leads to increased climate change. This might have a huge impact on the economy and life as a whole.

2.5.1 Various debates on climate change

The magnitude of the problem of climate change has increasingly sparked public debate in different circles. There are, for example, debates at the intergovernmental level, in the private sector, as well as within faith communities. All these discussions are relevant and shed light on the current study. Public debate around climate change can be traced back to the early 1970s when the global community began to give serious attention to it. According to Harris (2010:215), the issue of anthropogenic global warming was first

theorized in the 19th century, but only began to receive serious attention by the global community in the 1970s, with the first world climate change conference being held in 1979. In order to gain a proper knowledge of the problem it was decided that serious studies on climate change should be undertaken. On this basis, in 1988, the Intergovernmental Panel for Climate Change (IPCC) was formed, leading to the second world meeting for climate change. Since then, public awareness of climate change and its adverse impact on all forms of life has increased considerably. Therefore, the current public discourse on climate change is manifested in a number of ways, as follows:

Firstly, the United Nations Framework Convention for Climate Change (UNFCCC) and the Kyoto Protocol represent the general state of global debate on climate change. The central focus of the UNFCCC (UN, 1992:4) is a strategic stabilization of the GHG concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (UN, 1992:5). In line with this, the main feature of the Kyoto Protocol is to set binding targets for industrialized countries and the European Community for reducing GHG emissions (UN, 1998:2-3). Since 1992, annual debates and negotiations on climate change have continued under the title of “Conference of the Parties” (COP). In addition to UNFCCC and the Kyoto Protocol, climate change is also reflected in the Millennium Development Goals (MDGs) where one of the MDGs deals with promoting environmental sustainability. These are the central debates in the public arena, which demonstrate that climate change is a serious concern that the global community is occupied with, not only for the sake of humanity but, more importantly, for all living beings and the future generations.

A second aspect of the public discourse on climate change is the involvement of the private sector. In the private sector there has been significant recognition of environmental abuse and of the poor understanding of the role that ecological sustainability plays in industrial planning and industrial/economic growth. According to Fig (2007:5-6), traditionally many corporate businesses have concentrated on profit maximization, without paying enough attention to issues of corporate social and environmental responsibility (CSER). They are driven by systems created by people to fuel greed and get ever more from the earth from which living beings seek to prolong life and need sustenance. In this way, corporate businesses have significantly contributed to climate change.

However, some of these corporate businesses are increasingly beginning to articulate the need to recommit to a better management of social and environmental resources in a period of climate change. The King Report III, published in 2009, has argued that, for many corporate businesses, the bottom-line has been maximization of profit. In the context of environmental degradation and climate change, it must be understood that business success depends on the triple pillars: *planet, people* and *profit* [emphasis mine]. This, calls for a shift from the single bottom-line (the need for maximum profit) to the triple bottom-line (planet, people and profit) for any corporate business (IODSA, 2009:15). This is the case because climate change is of concern to all.

Thirdly, debates about climate change have been held by faith-based organisations (FBOs) as well whereby Christian faith communities are voicing their concern about global climate change and its adverse impact on the lives of the majority, especially those at the margins of society. The South African Council of Churches (SACC, 2009) affirms that climate change and environmental degradation are critical threats to the sustainability of life on earth. The Fellowship of Christian Councils in Southern Africa (FOCCISA) has also looked into issues of ecological debt and climate change and reflected on the engagement and the role of the church in this respect (SACC, 2009:82). Similarly, the World Council of Churches (WCC) took a critical stance as regards eco-justice and ecological debt in 2009, urging the global community to work together towards addressing the problem of global warming as the result of a degraded environment, due to unsustainable economic systems.

In addition, the Accra Confession has argued (Averell 2009:5; LenkaBula 2009:25) for the need to covenant for justice in the economy and in the use of the earth as a resource. Christian faith communities are further called upon to express their Christian conviction in the light of economic injustice and ecological destruction. In 2007, the All African Conference of Churches (AACC) conducted a study to determine issues deserving priority in the African-Europe relationship. This study led churches jointly to call upon all actors in the global community to minimize the GHG emission and to work together to address the challenges of climate change. Governments, churches and other stakeholders should develop programmes to re-generate the environment, undertake good environmental practices and promote afforestation (AACC, 2007:56). The report insists that conservation measures should take into account the protection of river bodies

and waterways and implement sound environmental management activities (AACC, 2007:57).

In Tanzania, for the past 10 years, the Christian Council of Tanzania (CCT) (2012:1-2), recognizing that climate change, on both a global and local level, requires attention and commitment of all, has been involved in raising awareness and publicizing the impact of climate change while insisting on the necessity to take care of the creation in all its aspects and at all levels of society. In these programs, Christian faith communities are encouraged to get fully involved in the protection of the creation, which sustains life on earth, especially in Tanzania where the majority of the population makes its livelihood from the natural environment through agricultural activities. Reflecting further on the Accra Confession, LenkaBula (2009:29), in her book: *Choose Life, Act in Hope: African Churches Living Out Accra Confession*, describes the confession as a statement of, and a commitment to faith. Faith communities are therefore asked to discern their ministries and work together for the sake of moderating global warming and climate change as a result of ecological destruction. The current discussions on climate change follow on a long period of theological reflection on issues around climate change and the ecological crisis, as will be discussed later in this study (see chapter 4). Since the entire debate on climate change has pointed to a clear link between climate change and natural environment, the following section has offered some details on this linkage.

2.5.2 Climate change and the natural environment

The widespread debates on the climatic situation have in common recognition of the links between the natural environment and climate change. On this note, Yanda and Mubaya (2011:53) point out that this link is based on the fact that climate change affects natural resources (such as land and biodiversity) and any change in natural systems, in turn, affects climate parameters. In addition, Cobb (1992:56) is also well aware that environmental, economic and climate change are strongly linked because economic activities involve the natural environment. Hence, the way that people treat the natural environment through economic activities, such as farming practices, impacts on climatic systems. Ultimately, environmental problems and climate change are the results of unsustainable economic praxis. In line with this, Michaelson (1992:130) argues that unlimited economic growth has resulted in environmental damage and climate change.

The links between climate change, environmental degradation and economy are also discussed by Kerber (2010:221) in his ecumenical work, “Caring for creation and striving for climate change.”

Kerber argues that human-induced climate change is being precipitated primarily by the current development pattern and endless economic growth strategies. On this basis, Wright and Kill (1993:109-110) urge communities to adopt a more sustainable development approach which takes into account both human and earth’s welfare. Such development praxis, assert Cavanagh and Mander (2004:14), was experienced in the 1960s and 1970s when most communities united to find economic alternatives that were implemented at a local level in many countries. This was the case before the introduction of a new unsustainable and single dominant economic model in the 1980s and 1990s.

In addition, Blank (1992:11), an economist and theologian, and Mcfague (2001:75), an eco-theologian, differentiate between the technical understanding of economics as the allocation of scarce resources among competing needs, and the concrete understanding of it as a management of plenty resources for the common good. The technical understanding of economics has produced the current economic system that operates and is governed by neo-liberal theories. Such neo-liberal policies place much emphasis on economic growth with less regard for the natural environment on which all creatures depend for material needs (Korten, 2001:28). This understanding is exploitative, not only as regards human beings but also in relation to the natural environment; hence opening the way for climate change.

Such an economic system, LenkaBula (2009) and Daly and Cobb (1989:5, 57) concede, is built on the propensity of individuals who act to optimize their own interests while ignoring the interest of the natural environment. Based on the framework of such an economic system, it is projected that climate change will continue to impact broadly across ecosystems, societies and economies, while putting increasing pressure on all livelihoods and food supplies (Yanda and Mubaya, 2011:57).

Reflecting on the situation of climate change in some parts of Africa, Yanda and Mubaya (2011:71) charge that changes in mean temperatures, rainfall patterns and rainfall variability are already extending dry seasons and increasing the severity of periodic

droughts. A good example is Tanzania where interior parts are experiencing higher temperatures and reduced rainfall while areas in the north-east, south-east and Lake Victoria are likely to experience severe flooding. In the light of climate change and environmental degradation, it is essential that the manner, in which humankind is economically active, particularly in the world of agriculture, gets reversed. On this note, Korten (2001:56) concedes that human beings must transform their attitudes towards the natural environment and use it in the way that considers and retains the balanced regenerative capacity of ecosystem.

2.6 Trends of climate change in Tanzania

Due to the fact that climate change has become a global issue challenging sustainable development and the very survival of humankind, no country is immune. The adverse impacts of climate change are becoming evident almost everywhere. Climate change has created a context of vulnerability and poses a serious risk to poverty reduction efforts. It is widely accepted that the impact of climate change will continue to be experienced in increasing degrees by the least developed countries, although they have contributed least to the problem (URT, 2007:V). In this respect, Tanzania is no exception and it is the reality that cannot be denied, a good example of which is the melting of snow on Mount Kilimanjaro, changes in rainfall patterns, floods and prolonged drought (IRCPT, 2012:4). As has been alluded to in section 2.3 of this chapter, agriculture is a dominant activity in Tanzania and the national economy is based on the use of natural resources, i.e. rain-fed agriculture and biomass for household energy. This suggests that, in the contemporary context, the national economy is highly vulnerable to the adverse impact of climate change and extreme weather events.

Reflecting on this situation, Shemdoe (2010:229) argues that climate change which is already underway in Tanzania, directly affects national development in multiple ways. Although the impact on social and economic sectors in Tanzania started to be felt as far back as the early 1980s, its gravity began to be recognized only recently. That the seriousness of climate change has only been realised at this late stage is largely due to the fact that the country did not have scientific evidence that would justify any concerns about, and possible responses to, the impacts of climate change - especially in relation to the world of agriculture.

According to the National Adaptation Plan of Action (NAPA) document (URT, 2007:14); there are two main aspects that determine the seriousness of climate change in Tanzania. These are precipitation (rainfall patterns) and temperature. Naturally, rainfall patterns in Tanzania are sub-divided into (1) tropical coast where the rainy season is March – May when it is hot and humid, (2) semi-temperate areas with short rains (*vuli*) in November-December and long rains (*masika*) in February-May, normally located in the mountains, and (3) drier areas (*kiangazi*) in the plateau region with considerable seasonal variations in temperature. In general, the mean rainfall varied from 500mm to 2500 mm and above, and the average duration of the dry season was 5-6 months. However, this is no longer the case today. Recently rainfall patterns have become much more unpredictable and some areas have been receiving an extreme minimum while others have been receiving an extreme maximum of rainfall per year (URT, 2007:14-15).

The analysis of the rain data collected from 21 selected regions in Tanzania indicates that there is a decreasing trend for over 13 stations i.e. sixty one percent, while in 7 stations, i.e. thirty three percent, an increased rainfall pattern has been registered. Only one station has an almost a constant rainfall pattern (URT, 2007:15-15, Agrawala, 2003:13, Ehrhart and Twena, 2006:6-7). This means that there are areas in Tanzania that have received, and that will continue to receive, more rain than required while other areas are subjected to insufficient rainfall patterns. Considering this point further, Kibona (2008:2) points out that areas like the northern and south-eastern parts of the country would experience an increase in rainfall ranging from between five percent to forty five percent. On the other hand, central, western, south-western, southern and eastern parts might experience a decrease in rainfall of between ten to fifteen percent, while the southern highlands might similarly experience a decrease of ten percent (Kibona, 2008:3).

Apart from the change in precipitation, there is also a serious change in the temperature pattern. Included in the NAPA document (URT, 2007:17) is an explanation that in Tanzania temperature naturally varies according to geographical location, relief and altitude. In the coastal region and on the offshore islands the aggregate temperature ranges between 27°C and 29°C while in the central, northern and western parts temperature is between 20° C and 30° C with the higher temperatures occurring between the months of December and March.

In the mountainous areas such as northeast and southwest and the Makonde plateau, the temperature occasionally drops below 15° C, especially at night during the months of June and July. On the whole, climate change is expected to raise the mean annual temperature by 3 to 5° C and the average daily temperature by 2 to 4° C by 2075 (URT, 2007:17, Ehrhart and Twena, 2006:5; Kibona, 2008:2).

Based on the climatic variations discussed above, Stiftung (2010:22) draws a conclusion that the existing climate condition in Tanzania is characterised by floods, droughts and a change in seasonal rainfall patterns resulting in infrastructure damage, displacement, erosion of livelihood assets and food insecurity. In the agricultural sector, climate variability has caused crop failure and hunger. In general there is a wide range of interrelated impacts on the environment, the economy and the well being of the Tanzanian people.

Due to the fact that Tanzania's economy is dominated by agriculture, which is worst hit by climate change, the development of this sector is subject to retardation (Stiftung, 2010:22). For example, because of higher temperatures, there will be a shift in areas viable for coffee and other cash crops, a reduction of maize output and higher losses to evapo-transpiration. Furthermore, increased drought will lead to crop failure, reduction of grazing land and stock losses. In addition, increased rainfall and change of seasons will result in soil erosion, land degradation, crop loss, change in crop yields and an increase in crop diseases. The cumulative results of all these are food insecurity, economic shocks, loss of incomes and livelihood options, and abject poverty (Stiftung, 2010:23).

Yanda and Mubaya (2011:74) present further empirical findings of their study, done in Tanzania on experiences with drought, especially in the Dodoma region. They clearly state that due to over-dependence on rain-fed agriculture by most people in rural areas, the climate change and climate variability have been major limiting factors for the agricultural production, hence affecting food security and income generation. Drought caused by climate change has been reported to cause failure of, and damage to, crops and livestock, leading to chronic food shortages. Apart from drought incidents, Tanzania has also been experiencing flooding over the past decades. It is estimated that thirty eight percent of past disasters in Tanzania have been caused by floods, the most notable being

the flooding that occurred in 1997/98, due to the El-Nino rains (Yanda and Mubaya, 2011:77).

2.7 Causes and impact of climate change in Tanzania

As indicated earlier in this chapter, climate change and the world of agriculture are intertwined. Studies have shown that climate change is the result of irresponsible and poor management of, and insufficient care for, natural resources (the environment). Accounting for environmental mismanagement, especially in the African context, Nhamo and Inyang (2011:9) argued that since the 1960s when environmental problems emerged to be a global policy issue, the approach to managing such environmental challenges has been re-active rather than pro-active. In addition, empirical studies in Uganda, for example, have revealed that the top-down approach of natural resource management has made a significant impact on natural systems that enhance life forms. It is recommended that local institutions can play an important role in managing natural environment, as compared to the central government (top-down) management (Hartter and Ryan, 2010:821). Communities need to be well informed and involved in the natural management process, knowing that proper management of natural resources ensures integrity, stability as well as beauty of the entire earth community (Hessel, 1996:1; Holling and Meffe, 1996:330).

Saldanha (1994:15) further explains that human exploitation of the natural environment has been unfolding along with the history of advancement. While the discovery of fire 50 000 years ago made humans capable of releasing energy that was stored in fuel, wood or fossil coal, further developments such as the invention of the wheel and the domestication of animals were essential in locomotion and transportation. Considering the impact of human advancement on the natural environment, Saldanha (1994:15) asserts:

From the Stone Age through successive stages of human civilisation, man has developed his intelligence to probe the functioning of nature and has developed his skills in utilising the resources of the earth to survive, communicate, build and dominate.

This development was clearly demonstrated during the industrial revolution when the machine began to replace human-power in the production process. The use of the machine led to increased productivity but also to a greater demand for raw material to be extracted from the earth (Saldanha, 1994:16). These developments gradually strengthened human's exploitative attitudes towards the natural environment.

In the context of Tanzania, where the natural environment is the main source of livelihood for the majority of people, the problem of climate change is associated mostly with environmental degradation. The URT (2008:3) report asserts that ecosystem deterioration, deforestation, loss of wildlife habitat and biodiversity are critical environmental problems that need urgent intervention. It has been stated that between 1990 and 2005, fifteen percent of forests have been cleared. In spite of the fact that forty percent of the country is protected in parks, forested areas are decreasing at a rate of one percent per annum. This indicates a strong trend to changing the use of land. The change represents a CO₂ emission of up to 100 million tonnes per year, which makes Tanzania a significant producer of CO₂ emission in Africa. The major reason for deforestation is the use of wood as fuel and the expansion of the agricultural sector that employs mostly unsustainable agricultural methods (URT, 2008:7). Hence, although Tanzania is characterized by rich, diverse and distinct terrestrial and aquatic ecosystems, habitats are modified and socio-economic processes are transforming the environment, resulting in degraded ecosystems that cause disruption of services provided and loss of biodiversity (Devisscher, 2010:16).

In general, environmental stress in Tanzania contributes significantly to the problems of climate change and climate variability. There are three main human-induced drivers of environmental stress that worsen climatic variability in Tanzania. These are changes in the use of land, sedimentation and water pollution, and over harvesting/exploitation of natural resources. A change in the use of land and of production systems refers to land conversion for the purpose of agriculture, deforestation, and land degradation due to unsustainable agricultural approaches. These changes are effected mainly through extensification and intensification of agricultural production: transformation from the use of natural resources for subsistence farming to commercial agricultural practices. The consequences on the functioning of ecosystems and for biodiversity are considerable (Devisscher, 2010:17). In Tanzania, the change of land-use is becoming an emerging

practice. This is reflected in the fact that in 1990 Tanzania had about 41.4 million hectares of forest and today this area has decreased to 33.4 million hectares. If the trend continues, it means that Tanzania will consume its forests in the next fifty to eighty years. When the natural resource is degraded, not only are habitats and wildlife affected but also the climatic system and the water regulation capacity (Devisscher, 2010:17).

Sedimentation (natural materials/particles broken down by processes weathering or erosion and transported by actions of wind, water or the force of gravity) and water pollution is another factor affecting ecosystems in Tanzania. It is linked to overconsumption of water, agricultural run-off and erosion. To a large extent, this happens when there is catchment damage by deforestation, poor agricultural practices on steep slopes and river banks, an encroachment of agriculture, livestock and settlement onto wetlands, industrial waste disposal, and a lack of sanitation (Devisscher, 2010:18).

Maltreatment of natural resources is another factor causing environmental stress. It occurs when there is a multiple and excessive use of ecosystem services and extraction of goods or resources from natural systems. In Tanzania such practices have caused considerable stress in ecosystems. Hence, it is land-use change, sedimentation and water pollution, and the over-exploitation of natural resources that are the major reasons for stress suffered by Tanzanian ecosystems. By nature, ecosystems that are in a degraded state are likely to show poor recovery when affected by climatic stressors and natural disturbances. The major reason for this is that persistent stress on ecosystems weakens their resilience, making them prone or vulnerable to natural disturbances that otherwise could have been absorbed. Therefore, the unprecedented global climate change is likely to especially affect ecosystems that already experience stress from multiple non-climatic causes, and their capacity to respond and adapt will be further undermined. Once an ecosystem loses its resilience, the effects of future climate change could leave it irreversibly changed (Devisscher, 2010:19, 22).

In line with characteristics of climate change outlined above, there are other factors that contribute directly to the question of climate change. These include technological adaptation and use, and external inputs such as the use of chemical fertilizers, pest control and irrigation in farming practices and in other usage of land (MEA, 2005:9; Malik, 2008:21ff). Generally, human beings, of all creatures, are seen as having the

greatest ability to intervene in ecosystems and to disturb its services for all forms of life on earth. However, reality dictates that the well being of humankind and of other living beings on earth can only be enhanced through sustainable interaction with ecosystems, in this case a sustainable agricultural approach. In order for such interaction to be realized, there needs to be support from all and everyone, including from institutions, organisations and from technology. Participation and transparency in the creation of instruments - institutions, organisations, and technologies - may contribute to freely making choices that increase economic as well as social and ecological security.

Hathaway and Boff (2010:56) view the current ecological crisis that has led to climate change as being a symptomatic pathological earth. The crisis necessitates a change of direction towards greater health for earth and for life on earth. Referring to the magnitude of the problem of climate change and the ecological crisis linked with life threatening agricultural approaches, they emphasise that it is not by chance that the world is experiencing this problem. Rather, the problem is systemic. It results from the current unjust and dominant “global economic, political and ideological systems constantly trying to convince us that the kind of globalization based on free market, financial speculation, deregulation, corporate power and unlimited growth is in some sense inevitable (Hathaway and Boff, 2010:56).”

Therefore, in order to create a turning point and move from a pathological to a healthy earth, there must be a clear recognition that the current system is obsessed with quantitative, undifferentiated, unlimited growth and disregard to the natural environment. It should be realised that giving primacy to gain and profit at all costs has created the current situation. Concentration of power and wealth in the hands of irresponsible corporate leaders has led to domination and exploitation not only of people who live at the margins of society but also of ecosystems (Hathaway and Boff, 2010:57).

There has been a considerable awareness that the current state of the earth is characterised by chrematistics (profit based or wealth accumulation based economy as opposed to a life-enhancing economic system), monoculture and domination (Daly and Cobb, 1989:138). Such awareness should lead to a practical move towards an authentic *oikonomia*- a word originated from Greek language emphasising a comprehensive stewardship- which implies a way of caring for the entire household, namely earth, the

only home for all living beings. Moreover, such consciousness should also generate a spirit that longs and desires to create a world where humanity respects the planet's ecological boundaries and where life is based on the principle of sustainability and a sense of supportive and cooperative community and where humans have multiple possibilities for earning livelihoods (Hathaway and Boff, 2010:58). Furthermore, in this alternative framework, humans must be aware of their dependence on the wider earth community and on the values of ecosystems as the foundation of all forms of life and human activity. Therefore, any human economic activity should be measured by what it contributes to a healthy relationship with the earth and to the sustenance of life. If ecosystems provide services which are beneficial to humankind, then humankind is responsible for nurturing ecosystems so that they may continue to provide services to all, especially in the world of agriculture (Hathaway and Boff, 2010:58).

From a biblical perspective, the creation of humankind out of soil suggests that humankind is rooted in, and thoroughly connected to, the essence of agriculture. For Christian faith communities this connection raises a moral obligation that allows the adoption of responsible agriculture. It is such moral obligation to agriculture that allows simultaneously reconciliation between economy, ecology, energy-efficiency, equity and employment. In other words, agriculture needs a linkage with Christian spirituality and should be seen as a vocation (Wibberley, 2006:3) for the service of humanity and the entire household of God. What is needed is a holistic theology, which is God and life-centred by nature, treating human beings and the created order in a more integrative and sustainable manner. In the context of Tanzania, where agriculture for many is identical to life, the church cannot be excluded from a call for transforming the world of agriculture, particularly in the context where climate change has become a threat to the sustainability of life on earth. In other words, For Christian faith communities, this calls for embracing "Christ's teachings of love and forgiveness as foundation" (Korten, 2006:122) which goes beyond humankind to include the entire earth community.

2.8 Climate change and the mission of the church

In the previous discussion, the current study has ascertained that in the context of Tanzania, as it is in African countries, climate change and world of agriculture are very much intertwined. The fact that agriculture is the first God given vocation, as depicted in

the biblical book of Genesis, extends to include the church as it strives to participate in God's mission of saving and sustaining the world. This means that climate change, agriculture and the Christian Church cannot be divorced from each other. Based on the creation story, the two cardinal principles that guide the mission of the church include responsible stewardship and accountability on how the resources in the household of God are used and the impact for all living beings. The Church in Tanzania, regardless of denomination, is largely the product of the missionaries. It is for this reason that it is difficult to speak of the Evangelical Lutheran Church in Tanzania (ELCT), for example, without associating it with the three major missionary societies: the Bethel Mission, the Leipzig Mission and the Berlin Mission both of which originated in Germany.

According to Kolowa (1991:2), these mission societies arrived in various places in Tanzania and at different moments in time. The broad objective of the missionaries' work was to spread the gospel of Jesus Christ among the people of Tanzania and the neighbouring countries of Burundi, Uganda, Kenya and Rwanda (Kolowa, 1991:2). Also, missionaries focused their ministry on *diakonia* and social work and evangelism (Kolowa 1991:10). Apart from spiritual work, the missionaries engaged in socio-economic development issues such as establishing schools and hospitals, as well as promoting agriculture (Kolowa, 1991:15). Reflecting on the three mission societies and their work in Tanzania, it is clear that their mission was inclusive, that is they regarded socio-economic progress as a necessary part of God's mission on earth.

Taking an example of the Lutheran church in Tanzania, for decades, different Lutheran churches that were the result of the mission work got united making a single Lutheran Church in Tanzania with its constituent dioceses (Kolowa, 1991:26). Kolowa (1991:28) highlights that the church in Tanzania (ELCT) sees itself as an instrument of God and called for service to the community as a whole. The first priority of the church is the proclamation of the gospel of Christ, since it is a mission-oriented church. Furthermore, the church is concerned with the sick, the disabled, the blind and deaf, as reflected in the mission manifesto of Jesus Christ as outlined in Lk.4:18-19, *The spirit of the Lord is on me, because he has anointed me to preach good news to the poor. He has sent me to proclaim freedom for the prisoners and recovery of sight for the blind, to release the oppressed, to proclaim the year of the Lord's favour.* For it is believed that a Christian church must "live a life bubbling with endless love from the cross... showing itself in an active involvement in questions of social and economic justice" (Larsson, nd: 74). It is on this basis that, from the beginning, the

church was involved in community development in multiple ways, including the building of schools and hospitals, drilling wells to supply safe and clean water in villages, etc. Such socio-economic developmental activities were designed to raise people's living standards (Kolowa, 1991:52).

Although the church has contributed significantly to national socio-economic development in terms of education and health services, not much has been done in the world of agriculture and climate change. Reflecting on the contribution of churches to efforts to combat challenges of climate change, Martin (2010: 91) has argued that despite the fact that issues of climate change have been one of the top news items around the world, the church has remained silent and not much effort has been made to use scripture as a resource to evaluate and analyse the gravity of the problem. Not only that, the church has made scant effort to explore agricultural potentials and whether or not the available natural resources are optimally and sustainably utilised. All these deficiencies call for the church to become an engaging entity, especially in relation to issues that threaten all form of lives for which God has a great concern.

Although it is apparent that the church maintains a high level of involvement in community upliftment and socio-economic development, as indicated earlier in this study, much attention needs to be given to the challenge posed by climate change, due to the fact that agriculture is the sector worst hit by climate change and climate variability.

In the context of climate change, the world of agriculture need to be transformed, thus promoting sustainable agricultural approaches. Any attempt to improving agricultural skills should go hand in hand with changing the ways that people view their natural environment, while teaching them to be responsible caretakers of the earth.

For the church, Wibberley (2006:6) argues, this entails an 'integral mission' approach rooted in the 'biblical wholes.' On the whole, climate change in Tanzania is real and agriculture is linked to climate change for it is a dominant economic activity. Therefore, climate change and the world of agriculture bring about questions of how people live and make their decisions regarding caring for God's created order on which all life forms depend. In this context, for the church to remain silent is not an option, but must rather deliberately engage and participate in the transformation process.

2.9 Chapter summary

From the outset, this chapter sought to contribute to addressing the central question of this study: *In what ways can an African Christian ethic of care be cultivated for sustainable agriculture in the context of climate change in Tanzania?* This has been done by addressing sub-question one, and two through describing the Tanzania's geographical location, its socio-economic situation and the climatic conditions while highlighting the church and its mission on earth, especially on issues of social concern. It has been argued that the natural climate in Tanzania is considerably determined by a number of factors such as its geographical location (close to equator) and its main categories of ecosystems, namely aquatic (including freshwater, wetlands, coastal and marine strips) and terrestrial (composed of forests, savannah, dry lands or deserts, and mountains). Although there are a number of sectors on which the economy is based, to a larger extent agriculture is at the centre of all of these. The main reason for this is that agriculture is practiced in the entire country and especially in the rural areas. Moreover, the agricultural sector alone employs eighty percent of the total workforce and, for seventy percent; it is the main source of income for rural communities while providing eighty five percent of the total export volume.

However, the adverse impact of climate change poses a serious risk for the productivity of the sector as it concerns mainly a rain-fed agriculture. Climate change may be a global issue, but its results are very obvious in Tanzania. Two climatic elements are important in determining climate change in Tanzania: precipitation (rainfall patterns) and temperatures. While some areas have been receiving more rain than required, other areas have been experiencing periods of drought and increased temperatures. Rain seasons have become either prolonged or shortened, affecting agricultural productivity. In the context of Tanzania, these changed patterns are a result of unsustainable interaction between humans and their natural environment, as evidenced by change of land usage, sedimentation and water pollution, and overharvesting of natural resources. Such human intervention has led to disturbed service provision by ecosystems. The dominating stance, taken by humankind in regard to its natural environment, has been exacerbated by the current economic system that is based on human gain and greed. Given that human-induced climate change threatens all forms of life, the need is evident for a change in attitudes and for embracing the principles of true *oikonomia* (earth community) where caring for the creation as a whole is central. The fact that climate change is real in Tanzania, agriculture is a dominant economic activity and the church has existed in

Tanzania for centuries raises the need for a re-conceptualisation of the human responsibility and their moral obligation on earth. In the midst of life threatening forces of climate change the church has a role and responsibility to offer a message of hope. Such prophecy of hope should focus on transforming unhealthy approaches to the world of agriculture while simultaneously redeeming systems and institutions that contribute to the destruction of the natural environment. This is an essential necessity in the Tanzanian context where agriculture - the key sector for realising socio-economic progress – has been extremely negatively impacted by and is also a significant contributor to climate change. For the purpose of the current study a detailed analysis of the link between the world of agriculture and climate change is now required. To this task, chapter three is devoted.

CHAPTER THREE

FARMING METHODS IN THE WORLD OF AGRICULTURE AS VICTIM OF AND CONTRIBUTOR TO CLIMATE CHANGE

The good farmer sees him or herself as a dispenser of the mystery and grace of God. To live intimately and sympathetically with the earth is to see that we are surrounded and sustained by gifts on every side and to acknowledge that the only proper response to this unfathomable kindness is our own attention, care and gratitude (Wirzba 2003)

3.1 Introduction

Although traditionally the term ‘victim’ has been used in association with the affected human beings, depicting anthropocentric attitudes, a recent publication titled *The New Faces of Victimhood...* offers a broader perspective of the word. In this publication, Verschuuren and Kuchta (2010:131) in their article “Victims of Environmental pollution in the slipstream of globalisation”, agriculture is mentioned as one of the victims of dumping toxic waste in Abidjan. On this basis, the term ‘victim’ has been deployed in this study to capture the broader perspectives of the effect of climate change within which agriculture is included. The focus of chapter two was to contribute to addressing the main question of the study, which states: *In what way can an African Christian ethic of care be cultivated to enhance sustainable agriculture in the context of climate change in Tanzania?* In this regard, sub-questions one and two of this study attempted to determine the state of climate change and its impact on land, in relation to the world of agriculture.

Using the same principle of ecological transformation, i.e. unmasking earth pathology, chapter three is set out to respond to the key question of the study as stated above by addressing sub-question three through articulating the interplay between climate change and the world of agriculture. In this chapter, an attempt has been made to demonstrate how agriculture plays an ambiguous role of being both the victim and contributor (abettor) of climate change. In the first place, the chapter begins by demonstrating the vital role of the agricultural sector for sustaining various forms of life on earth. Then the chapter deals with the interrelationship between farming, environment and economy in relation to climate change. Section three exhibits ways through which agriculture evolved, whereas section four discusses the dominant approaches to agriculture, followed by

section five and six which give attention to the interplay between climate change and agriculture

3.2 Agriculture and its life sustaining role on earth

Undeniably, agriculture is one of the critical activities for sustaining life on earth. Adams, Chang, McCarl and Colloway (2010:1) and McMahon (2013:7) assert that agriculture is of obvious importance to human welfare and the wellbeing of all other living creatures. On the other hand, climate is a major determining factor for both the locations fit for agriculture and the productivity of agricultural enterprises. Therefore it is not surprising that agriculture has been identified as an area of concern in the current discourse on cause and effect of climate change. Adams et al. (2010:2) further note:

On a worldwide scale, the agricultural sector is more than receptor of possible climatic changes arising from anthropogenic trace gas emissions; it is also a source of trace gas, including carbon dioxide (CO₂), Methane (CH₄) and nitrous oxide (N₂O). The understanding of agriculture's contributions to the trace gas emissions has increased considerably over the last decade.

Similarly, Pye-Smith (2011:2) asserts:

Agriculture is not just a victim of climate change. It is also a significant cause of climate change. Agricultural activities are directly responsible for 10-12 per cent of human generated GHG emissions excluding emissions resulting from fuel use and fertilizers production. Agriculture is responsible for a much greater share of GHG emission if the clearance of forest to make way for crop and livestock is included.

However, before discussing agriculture in relation to the problems of climate change, it is imperative to understand the critical role of the agricultural sector for life sustenance. Agriculture is a complex economic sector with multifaceted effects impacting not only on humankind but even more on the natural environment. This is largely due to the fact that its production process is based on the utilization of biological and natural diversity (Walls, 2006:3). Youdeowei and Akinwumi (1986:2) stress that food production is very important in the economies of most of the least developed countries and that agriculture offers the means for increasing food and fibre production. It is, *inter alia*, through

agriculture that human beings are capable of harnessing the natural resources of the land, in forests, rivers, streams, lakes etc. and thus fulfil their needs and promote national development.

In most tropical countries, agriculture has always played an important role in sustaining life, especially in those areas where at least seventy five percent of the total labour force is engaged in the world of agriculture, an example of which is Tanzania. Youdewei and Akinwumi (1986:3) contend that the vital role of the agricultural sector pertains to five categories. The first category is the production of food in the sense that the food consumed in most developing countries is predominantly produced by local farmers. Furthermore, it is widely accepted that people must have food of a high quality and in adequate quantities in order for them to be able to improve and maintain their health and nutritional wellbeing. The second category is the employment aspect of agriculture, meaning that in developing countries, especially on the African continent in general, and Tanzania in particular, agriculture provides jobs to a large number of people as farmers, crop processors, traders, transporters or middlemen, not to mention research scientists, administrators, teachers, bankers and politicians working in the sector (Youdewei and Akinwumi, 1986:4).

A third category has to do with industry in the sense that most industrial raw materials are agricultural produce. A good example of this is sisal, a plant used to make ropes, cloth, etc. and which is needed for the production of jute (fibre) bags used to transport various commodities. Also, industries manufacturing vegetable oil, rubber, textile, canned foods and soap use agricultural products as their raw materials. The fourth category is the agricultural sector as a source of income. Hence, agriculture is undoubtedly a major source for domestic and international trade, providing revenue for both people and governments, either through direct sales or through taxes.

The fifth category refers to education and training. In order to ensure proper development and improvement of the agricultural sector, institutions are established to educate and train people in the science of agriculture, hence providing them with potential career, especially young people in tropical countries such as Tanzania (Youdewei and Akinwumi, 1986:5). Taking this point further, Maxwell (2001:36) mentions food, livelihood, market, raw materials and foreign exchange as critical

contributions that the agricultural sector make to the well being of any society. These are a few highlights indicating the importance of agriculture for life and development as it interacts with the natural environment in its production processes. There is a need, however, to briefly discuss the relationship between agriculture, the natural environment and the economy in relation to climate change before reflecting in greater detail on how agriculture has come to be both victim and advocate of climate change.

3.3 Farming, environment and economy in the light of climate change

Cobb (1992:56), Gnanakam (1999:144), and Abraham (1995:68) contend that environment, economic systems and climate change are intrinsically linked because any agriculture, as part of the economic system, needs natural resources in order to succeed. Emphasizing this further, Michaelson (1992:14,130) argues that the current economic system, based as it is on unlimited growth and industrialization, is the root of environmental destruction that exacerbates climate change, especially considering the serious havoc caused in the natural environment by modern agricultural methods. In his ecumenical work titled “Caring for creation and striving for justice”, Kerber (2010:221) points out the existence of this link as well. So does Timberlake (1994:51ff), who infers that agriculture and climate change are linked. In the African context, poor and environmentally unsound agricultural approaches result in climate change in the following ways: over-cultivation, overgrazing, preference of cash crops over food crops, and poor irrigation which turns most of the fertile soil into salty (Timberlake, 1994:53).

On the same note, Goussard and Labrousse (2011:60) assert that in most African countries the natural environment has been strongly modified and affected by human activities such as agriculture. These activities have taken various forms in the past decades, influenced by Western industrial agriculture that started in the colonial era and that have gradually replaced traditional ways of doing agriculture which were more sensitive to the environment. These agricultural approaches went hand in hand with dominant development theories, respectively. Maxwell (2001:38) uses the term ‘paradigm shift’ to explain how agriculture has changed over time under the western influence. For example, when the dominant development paradigm placed much emphasis on economic growth through industrialisation (i.e. the 1950s), the agricultural strategy gave significant attention to the cash crops rather than food crops; hence plantation economy

was introduced in most developing countries. As a result of these practices and influences, Tanzania currently experiences frequent droughts and floods that significantly contribute to crop failure and prolonged famine incidences (Yanda and Mubaya, 2011:72-79).

Reflecting further on the Tanzanian context, Shemdoe and Mwanyoka (2010:1) as well as Ehrhart and Twena (2006:2-3) argue that climate change has affected the national development process and continues to do so. The reality of climate change in Tanzania is manifested in altering levels of water in rivers, sea and lakes, altering weather patterns, the rising sea level, and the increasing intensity and frequency of extreme weather conditions and events. Historically, climate change in the social and economic sectors in Tanzania began to be felt as far back as the early 1980s. However, the gravity of the impact began to be recognized only recently and, in terms of policy aspects, climate change is a very recent phenomenon (Shemdoe and Mwanyoka, 2010:2; Cavanagh and Mander, 2004:210; Boff, 2008: 14).

Ezedinma and Youdeowei (1986:6) have described agriculture as a purposeful activity through which elements in the natural environment are harnessed for the production of plants and animals to meet human needs. It is a biological production process that depends on the growth and development of crops within a given setting or environment. Explaining this further, Wibberley (2006:1) contends that agriculture functions on the basis of two major processes of nature, namely photosynthesis and decomposition. During the process of photosynthesis, Ezedinma and Youdeowei (1986:7) add, crops take in carbon dioxide from the air, moisture and mineral nutrients from the soil and, by trapping the energy from the sunlight, they convert these simple compounds or elements into complex food material leading to the growth of leaves, fruits, seeds, fibre, oil and wood or fuel. During this process, photosynthesis also leads to crops producing and releasing oxygen into the air in order to produce their own food. Decomposition on the other hand is a process whereby the energy of sunlight, carbon-dioxide and water, stored in plants, is converted into glucose, providing them with energy and food to make them grow.

Similarly, Darnhofer (2012:16) describes agriculture as a dynamic and complex interrelationship between the farmer, the natural environment and the farm itself. In order to enhance the sustainability of real-life agriculture, these natural dynamics and

complexities cannot be ignored. This is critical, Hicks (2012:10) argues, because agricultural activities depend heavily on the benefits derived from the natural environment. Such benefits include pollination, pest control and nutrient cycling. Given that agriculture is extractive with regard to the natural environment, in the sense that it takes natural resources from the earth and turns them into food, the balance between the two needs to be maintained by ensuring that agricultural producers take advantage of opportunities offered by nature in a responsible manner. Doing responsible agriculture in this context bears the potential of promoting balanced and sustainable practices of food production, sustaining natural resources and reducing poverty. This balance is crucial because farming practices and the natural environment are inseparable (Schneider and Zurek, 2012:1-2).

In contemporary society, where the agricultural sector is dominated by industrial farming methods aiming to maximize profits, the creation of a better balance between agricultural production and the natural resources is of great importance. This is due to the fact that such balance would offer ample opportunity for the redress of environmental problems that have accrued in the period of intensification of agriculture without considering the consequences, leading to climate variability and change, which in turn affect life and the productivity of agriculture (Firbank, 2005:163). Given that agriculture has been in existence since time immemorial, it is worthwhile to reflect briefly on the evolution of farming practices in the following section.

3.4 The evolution of the agricultural sector

According to Rodriguez, Sultan and Hilliker (2004:28), agriculture has since long been the main source of livelihood for the majority of the world's population. Taking this point further, Claxton (2010a:44) points out; those agricultural activities have evolved from applying less intensive energy to a more energy-intensive approach. They have also shifted from being less productive to becoming more productive and from causing limited harm to becoming more harmful to the natural environment. As agriculture evolved, humankind was capable of choosing a variety of crops which, though high yielding, were less prone to the onset of epidemics and disease. Generally, shifts that have occurred in the world of agriculture brought with them significant changes in land-use patterns and the health of ecosystems.

Claxton (2010a:45) and McMahon (2013:8-9), reflecting further on the effect of agricultural activities on the natural environment, have traced three stages of human societal development, accompanied by the evolution of different agricultural approaches. The society of hunters and gatherers, whose life was so closely connected to nature, was partially replaced by an agricultural society with primitive agricultural system (PAS), resulting from the human quest for a stable source of living. At this stage humankind, sensing that such intervention might cause harm to the very environment on which they depended for their livelihood, applied the only known simple methods of fertility regeneration, such as burning wooden logs to increase mineral fertility and also augmenting the water supply to plants by artificial flooding. This provided their agricultural activities with a degree of permanence, provided there was a possibility of recurrent use of the same stretch of land. Although little impact of their agricultural approach on the natural environment can be measured at this point in time, it certainly was not sufficient to affect the natural functioning of nature (Claxton, 2010a:45).

After PAS, agro-horticultural society (AHS) evolved, where humankind began to use metal tools and to incorporate plants and animals for fertilization, while practicing simple irrigation. To a large extent, agricultural methods used were still not hostile to the natural environment. After AHS then followed the so called agrarian society (AS), the third level of development in the world of agriculture. In this more advanced period, society split into two sectors, one food-producing and the other commodity- or technology-producing sector. For the sake of convenience, scholars have termed the type of agriculture at this period as a traditional one. At this point in time, humankind had the capacity to produce enough food to meet the needs of a number of people much greater than those who were directly involved in agriculture (Claxton, 2010a:46).

With the passage of time, the production of other commodities such as ornaments, cloths, agricultural implements and accessories continued to increase. As a result, the commodity-producing sector expanded and soon became bigger than the food-producing sector, calling for a more advanced farming system that was capable of greater food production. Therefore, the development of an agrarian society had paved the way to modern agriculture, an agricultural system aimed at meeting “off-site” demands, i.e. the needs of non-farming groups situated far from the areas where agricultural goods

were produced. It is at this point in time that human beings began to design sophisticated tools, employing fossil fuels and electricity, in order to boost production (McMahon, 2013:12). However, the non-farming group grew faster than the production capacity of agro-ecosystems (Claxton, 2010a:46). It then became necessary for humankind to take a different approach to agriculture so that sufficient food could be produced to meet the needs of people active in other economic sectors as well. This brings our discussion to the adoption of various approaches to the world of agriculture and their detrimental impact on the natural environment.

3.5 Dominant approaches to farming

In the world of agriculture, there are three basic dominant approaches that have been adopted by human society. Each of these approaches has impacted on the natural environment in different degrees. These approaches are traditional farming systems; modern farming systems and green revolution, as discussed in the sections that follow.

3.5.1 Traditional farming systems

Traditional farming is an agricultural approach that adheres to traditional methods of agriculture (Aron, 2011:1-2). Apart from their labour-intensive nature, low yields and the high quality of food they produce, traditional agricultural methods are environmentally sensitive and do not use concentrated agrochemicals, common in modern farming, that are detrimental to soil fertility and the natural environment at large. Wright (1999:150) rightly argues that traditional agricultural methods are largely found in African societies. Based on experiential knowledge, African traditional farmers are aware of the importance of maintaining the natural functioning of ecosystem which supports agricultural production and life in general. Therefore, traditional agricultural systems are characterised by effective tillage, fallowing and plant intercropping, which can also reduce crop vulnerability to diseases. In other words, traditional agricultural systems use integrated methods that reduce harm to the natural environment and still ensure enough food production. In the contemporary context where climate change poses a serious challenge, integration of agricultural knowledge and practice can pave the way towards

future agricultural sustainability. It is on this basis that Mascarenhas (2003:3), when reflecting on the situation in Tanzania, comments:

Failure to use knowledge, even in the formal sector can lead to serious economic, social and environmental problems. Tanzania cannot be indifferent to the use of knowledge irrespective of whether it is modern/scientific or local/indigenous... All societies and communities possess knowledge and have used it to survive. The development of human societies is a measure of the extent to which they have generated and used knowledge. Pre-colonial communities in what is known today as Tanzania had a range of knowledge pertaining to the flora, fauna, food and nutrition, environment and land use practices, irrigation and water management practices... And the majority of people of Tanzania continue to use this knowledge today.

In the above reflection, the scholar pinpoints the fact that, over the centuries, there has been an accumulation of knowledge through experience and observation which allowed people to produce food by interacting with nature by applying such conservation farming practices. Studies have shown that in pre-colonial societies, especially in the African context, such conservation agricultural methods were based on a close relationship that existed between humankind and natural environment. This relationship was also reflected in African religious systems. It is on the basis of this understanding that Murombedzi (2003:2) explains:

A great deal has been written about the notion of 'sacredness' and the role that sacredness plays in conservation. The notion of sacredness is seen as representing important pre-colonial environmental conservation issues. Sacred pools relate to wetland conservation and so on... Sacred places represent different scales of conservation from the individual hunter's shrine, for instance, to larger sacred territories managed by several religious and political authorities.

This suggests that the natural environment was not completely humanised. Almost everywhere there remained places that had not yet been subjected to human intervention. According to Murombedzi (2003:3) these places became very significant in the community in two ways. They represented hidden forces on which humankind was able to draw for survival and because the environment harboured these essential forces, it also reminded the community of the need to take care of the natural surroundings. The community knew that any intervention in God's created order by human beings might

endanger their own survival and sustenance. As he goes on reflecting on pre-colonial, environmental conservation techniques, Murombedzi (2003:4) says:

Local communities developed an intimate knowledge of their ecosystems and used this knowledge to tailor systems of sustainable resource use (farming) and management that were appropriate to these systems. Local resource users developed intimate knowledge of the ecological status of resources, rates of reproduction, and rates of sustainable off-take...Indigenous knowledge was deployed and reinforced in religion to regulate resource use. Thus, traditional healers developed regulations around the harvesting of medicinal plants...hunters, fishers and pastoralists all developed highly complex resource regulatory systems based on the productive and reproductive capacity of the resource in question.

This reflects the management of natural resources, as organised by indigenous people (bottom-up), in opposition to the modern management of natural resources, organised, planned and commanded by professional foresters and officials whose methods and aims are subjected to policies pertaining to forests, the general environment and land use and to written laws defined by parliaments and by-laws defined by district councils, all representing top-down approaches to managing the natural environment (Ylhais, 2006:3).

3.5.2 Modern agriculture

Apart from traditional agricultural system, as discussed above, the modern agricultural system is another approach to the world of agriculture. Wirzba (2003:72) argues that although it is rarely commented on,

One of the most decisive practical developments in the movement away from experience of the world as creation can be found in the transformation of agrarian into industrial... Agrarian life, with its concrete and practical engagement with the forces of life and death, makes possible the intimate knowledge of and sympathy for the earth that are inseparable in the care of creation.

The transition from traditional agricultural system to modern agriculture formed a foundation for environmental degradation which leads to the context of climate change today. Although modern agriculture is similar to traditional agriculture in its aspect of food production by land cultivation, the modern approach is modified and improved by the introduction of heavy machinery and agrochemicals to ensure the highest yield with less manual labour. It is on this basis that Altieri and Koohafkan (2008:3) and also

McMahon (2013:21-23) argue that, to a large extent, modern agriculture is a fossil fuel energy intensive approach to farming practices. Its development is tightly bound up with the following factors: energy, trade and globalisation. Similarly, Mugambi (2000:77) traces modernisation of agriculture to the development known as industrialisation and to the so-called industrial revolution (1750-1850).

Industrialisation is a mode of production, based on machinery rather than manual labour. It is the period when agricultural production shifted from manual to mechanised approaches to agriculture. Generally, it was characterized by the installation of machines to replace manual labour, starting in the textile industry and stretching to the world of agriculture, thereafter spreading to other economic sectors. Although not all countries - especially African countries - became part of the industrialisation process, the industrial revolution had a great influence throughout the world with most countries coerced into adopting modern approaches to agriculture in order to reap the benefits of development and technological advancement.

3.5.3 The green revolution initiative

As reflected above, agricultural modernization was about industrial production of agrochemical inputs which replaced the traditional farming methods. In the 1960s, the modernization of agriculture also involved improved seeds. Therefore, parallel to the advent of industrial agriculture a 'green revolution' initiative occurred which was aimed at improving food security in developing countries. According to Green (2008:127), 'the green revolution' emerged in the context of; firstly, the widespread adoption of new rice and wheat varieties combined with the use of agrochemicals in largely irrigated farms. Secondly, such initiative was motivated by the state investment in infrastructures and in institutions to ensure stable prices of agricultural produce for farmers. The term 'green revolution' therefore is used to describe the technological response to worldwide food insecurity that had worsened in the period post World War II. It is this technological response that, in many regions of developing countries, transformed the earlier agricultural methods with their sensitive handling of the environment (Fitzgerald-Moore and Parai, 1996:1) to agricultural methods that are hostile to the environment.

The Green revolution involved the introduction of commercial inputs particularly seeds and agrochemicals, developing markets within countries, both regionally and globally. Farmers in the developing countries were encouraged to adopt green revolution initiatives, thus becoming a market for agrochemicals made in foreign countries with negative implications for the natural environment that exacerbate incidences of climate change and variability. This is the case because its chemical concentrated nature affects the natural functioning of ecosystems that regulate climatic conditions. Developing this argument further, Martinussen (2004:141) adds that the international community has tried to extend the green revolution initiatives to the new groups of agricultural producers while paying little concern to the natural environment. Reflecting further on Green revolution initiatives, Deb (2009:193) argues that this initiative “favoured capitalist farmers and not marginalised impoverished peasants.” On the whole, the Green revolution tended to sideline all traditional foods that were produced and consumed by smallholder farmers (Deb, 2009:194).

Industrial agriculture and the green revolution initiative have brought about a significant increase in productivity. More cereals and more animals per hectare, more milk per cow, and more food output per person are being produced, indicating that knowledge and skills can promote the provision of large amounts of food. However, the agricultural methods and technologies constituted in industrial agriculture and the green revolution initiative have been found to be hostile to the ecological systems at large (UNEP, 2008:15; Fitzgerald-Moore and Parai, 1996:1). While modern agricultural approaches are praised for increasing food production, Hezell (2002:3) points out that the green revolution cannot escape from carrying the blame for severe environmental degradation and injustices such as increased inequality, unequal asset distribution, worsening absolute poverty and the failing of many smallholder farmers due to the fact that they could not afford the necessary heavy capital investment.

At the same time, the United Nations Conference on Trade and Development (UNCTAD, 2008: iv) asserts that during the 20th century modern agricultural methods, involving a high level of use of synthetic fertilizers and pesticides and a heavy reliance on large-scale mono-cropping systems, have dominated agricultural production at the expense of the ecosystem, leading to a change in natural climatic conditions. This is the case because the methods of agriculture in question have resulted in increased loss of biodiversity, the contamination and depletion of water resources, a loss of soil fertility,

the marginalisation of small holder farmers, an increased level of pesticide-poisoning and the ever-increasing inefficiency of the agricultural sector, as well as crop contamination and air pollution (Deb, 2009:206-210). It is due to the influence of industrial farming methods that began during colonial rule, that Tanzania has for many years remained focused on producing agricultural produce for export, in order to be able to import some industrial products.

3.6 Agriculture and climate change in Tanzania

In the case of the Tanzania, the country's economy is highly dependent on agriculture (URT, 2003:16). However, agriculture in this country contributes to climate change through ineffective and inadequate approaches to agriculture and a lack of concern for the environment (Timberlake, 1994:55). Adosi (2011:2) and Van Beukering, Kahyarara and Massey et al. (2007:7) explicitly mention the agricultural sector as one of the areas that are vulnerable to climate change in Tanzania. Timberlake (1994:7) points out that the reason lies in the environmentally unfriendly approaches to agriculture, including over-cultivation, overgrazing and deforestation which lead to soil erosion among other factors. This implies that poor resource-base management is among the major weaknesses of the agricultural sector in Tanzania, greatly contributing to climate change (URT, 2001:8; Msafiri, 2007:24; Scherr and McNeely, 2001:7).

In order to reverse the situation, it becomes increasingly important to intensify public awareness of and care for creation, allowing for natural resource management from the grassroots level upwards. Due to the fact that agriculture dominates land use, especially in Tanzania, and is hence a potential influence on the change of climatic conditions, there is an urgent need to revisit the ways that humans relate to the non-human world, especially through the ways in which they engage with the world of agriculture. (Scherr and McNeely, 2001: 8-11). On this basis Wangari Maathari (2010:4), the Kenyan champion of the Green Belt Movement, propounded: "I am doing what I can. There is always something we can do. By taking action, we can demonstrate our hope for our future".

Moore and Nelson (2010: xvi) appreciate the heroic task undertaken by scientists in alerting the global community to environmental calamities, both from the economic and

the technological point of view. The critical question that remains is how people can be moved to act in order to save the earth, which is in peril. Given that human beings are moral beings, there has been too little discussion leading them towards the insight that sitting back in self-comfort at a terrible cost to future generations is not worthwhile and unethical (Moore and Nelson, 2010:xvi). As Maathari (2010:272) argues, the destruction of the natural environment will undermine the quality of life of generations today and in the future. This suggests that in order for farmers to be able to care for the natural environment, they need to recognise that they are the principal custodians and beneficiaries of the natural environment. Deploying unsustainable farming practices threatens life support systems of all living beings on earth.

Historically, in order to gain an understanding of how modern farming practices that harm nature came to be adopted by farmers, particularly in Tanzania and in Africa in general, Ylhais (2006:6) states that the situation regarding environmental conservation in the pre-colonial period was potentially promising. This is of critical importance because; argue Nhamo and Inyang (2011:2) from the African context;

It may be wrong to assume that the current environmental problems stem from African origin, neglect or lack of civilisation. Much of the current environmental decay is a manifestation of Africa's colonial histories. Such histories testify to the fact that the partitioning of the continent and its resources, including brutal dissection of cultural arrangement and physical boundaries, have contributed immensely to the wounded terrain we see and experience today.

Though there existed no Tanzania as a political or social unity as it is known today, and although there was no single country-wide system of ecological control, many local systems were improvised that regulated the relationship between humankind, society and natural environment. Ylhais (2006:5) says:

In a long process of trial and error and careful transmission from generation to generation, the people in pre-colonial societies had gathered and stored an extensive amount of ecologically sound knowledge of their own functioning and their immediate environment which was brought to bear on their systems of production and reproduction.

In Tanzanian pre-colonial context, environmental care was divided as two major categories, relating to the sacred environment and the normal environment. These

categories were classified according to varied purposes. The sacred natural environment represented the most important areas for pre-colonial societies and they had strict prohibitions pertaining to access and secular utility (Ylhais, 2006:7). They were set apart for special functions organised for the well being of the society at large, such as rain making, training younger generation, producing clean air, boundary markers etc. The normal areas on the other hand, had to be carefully utilised for meeting the needs of the communities in a sustainable manner, including creating reserves for future agricultural activities. It is important to note that, during the pre-colonial period in most African communities, conservation and care of the natural environment were based on the premise of unity between humanity and nature. This understanding is further discussed in the section that follows.

3.7 Farming systems during the pre-colonial and colonial periods in Tanzania

Based on the understanding that humanity is not isolated from the rest of creation, communities were able to devise strategies for preserving the natural environment, while at the same time guaranteeing responsible access to it. In view of this, Rodney (2005:40) contends

...in the centuries before the contact with European, the overwhelmingly dominant activity in Africa was agriculture. In all settled agricultural communities, people observed the peculiarities of their own environment and to find techniques for dealing with it in a rational manner. Advanced methods were used in some areas, such as terracing, crop rotation, green manuring, mixed farming and regulated swamp farming.

However, the fact that access to and the use of natural resources, especially through agricultural activities, were mitigated by policy, religion, customs and practices, indicates the potential desires to control the imbalance between agricultural activities and the need to maintain ecological functioning. The pre-colonial system of sustainable farming on the one hand, and, on the other hand, the conservation of the natural environment based on the close relationship between humankind and nature, was heavily challenged by the process of colonisation. This was largely due to the colonial introduction of export crops such as cotton, coffee, tea, etc which went hand in hand with downplaying the indigenous economic system (Rodney, 2005:103).

Apart from colonial land appropriation and the introduction of wage labour that transformed human behaviour towards nature, Christianity also contributed by challenging the basic African religious understanding of nature, especially the African religious belief that linked humankind to the natural environment (Murombedzi, 2003:3). Another factor that challenged the pre-colonial system of agriculture and environmental care was colonial rational understanding of nature, whereby nature was defined as the absence of human impact, especially European impact. As a result of this, nature came to be regarded as relating to those regions that were not dominated by Europeans. Explaining this further, Murombedzi (2003:4) identifies four central features of colonisation that affected the traditional human understanding and relationship with nature.

- The development of science and technology and their deployment to manipulate nature;
- Expansion of the capital economy;
- Creation of the executive government transforming social action into rational organisation leading to a hierarchical organisation; and
- Elaboration of formal legal systems.

On the basis of this colonial rationality as regards nature, it came to be assumed that human life could be uncoupled from nature: the human capacity for reasoning enabled man to escape from nature, place him/herself above nature and remake it in order to meet his/her demands. Behind the colonial processes stood a profound belief in the possibility of restructuring and reordering nature to serve humanity using science as one of its mechanisms. This entails the influence of the Enlightenment, a movement which believed that the power of reason could free knowledge from all doubts. Forster (2008:144) describes the Enlightenment as a philosophical movement of the 18th century which overemphasised human reasoning over blind faith or obedience; hence it contrasted with much of the religious and political order of the day. Critical and scientific thinking scrutinising previously accepted doctrines and traditions led to many reforms of a humanitarian nature.

Given the nature of the colonisation process, it is clear that European colonisation had an impact not only on human beings but on nature as well. Unlike African perceptions of a unity between nature and humankind, the colonial understanding of nature was based

on the Enlightenment's dualistic view of humanity and nature. Influenced by this Enlightenment construct, the natural environment came to be understood as a resource for humanity, to be used and conquered. Indigenous people and their natural environment were portrayed as areas of rational deficits: empty, unused or at least underused (Murombedzi, 2003:4).

The interest of the colonial powers was focused on the management and the development of the productivity of natural resources and, in this context; they considered the local people to be hostile to the environment. Thereby they legitimised their control of the most important material resources that belonged to local people who were then isolated from the most productive land and forests (Ylhais, 2006:2). According to Karen Oslund (2009:12), colonialism provided a powerful impetus towards nature's destruction by discounting indigenous knowledge and indigenous use of their natural environment.

During British colonial rule, unlike in the time of German rule when plantation agriculture was dominant, individual farming was encouraged in Tanzania, not only for purposes of subsistence but for marketing purposes as well. In order for people to be able to produce in excess, modern farming methods were preferred, with little attention being paid to the impact of such agricultural methods on the natural environment. Priority was given to crops for export such as sisal, coffee, tea, etc (Bode and Wu, 2011:16). On the whole, although reasonable profits were realised, colonial policies in agriculture, pertaining to land and labour, gave rise to discontent and encouraged overexploitation of the natural environment. Most smallholding farmers were reluctant to adopt the new farming methods and new crops and tried to resist the colonial government's demand placed on them, but with little success (Bode and Wu, 2011:19). As a result of these external influences, human activities in Tanzania, agricultural activities included, have over the past fifty years affected the replenishment of natural ecosystems to the point of diminishing the capacity of the land to support agricultural production and to support life in all its forms.

In this regard, Kwashirai (2008:3) contends that, in many aspects, African countries have suffered colonial intrusion. The natural environment has endured several years of anthropogenic modification of ecosystems which have hence inflicted changes on the

climatic conditions across the African continent and especially in Tanzania where agriculture is the dominant sector. Moreover, advanced technology has increased the human capacity for transforming local environments, driven by global market demand, especially for minerals, food and cash crops (Kwashirai, 2008:3). Given the current situation of climate change induced by irresponsible human interaction with the natural environment, it is imperative that human actions, beliefs, notions, labour and tools, are transformed so that they can play a significant role in turning the current state of the environment in Africa, and Tanzania in particular, into a healthier one (Kwashirai, 2008:4).

Soon after independence Tanzania, like many other countries in Africa, embarked on a drive to modernised agriculture with a special focus on rural areas. In this regard, Tulahi and Hingi (2006:3) contend that the Arusha declaration, launched in 1967, signalled a new direction for modern agriculture in Tanzania, including an insistence on communal ownership of the land, the nationalisation of private estates and the forming of village units, as described below.

Since the country's independence 1961, the government has implemented a series of agricultural related policies, plans, strategies and programmes that were integrated within five year development plans. Immediately after independence overall agricultural policy was characterised by market-based interventions. After the Arusha declaration in 1967, agricultural and environmental policy was characterised by more government-led intervention. These included the nationalisation of the private sector enterprises throughout the major chain export commodities. This resulted in establishment of state farms, state processing and marketing enterprises and state controlled cooperative unions (URT, 2011a:1).

While environmental conservation was recognised as an important aspect of sustainable agriculture, the policies guiding the Tanzanian agricultural sector remained generally silent regarding environmental care through agricultural activities (URT, 2011a:3). It is on this basis it is argued that due to the unsustainable agricultural methods employed, the agricultural sector in Tanzania remains at a low performance level as Msafiri (2007:3-4) indicates:

Recently, however, crop productivity has been irreversibly subject to the principle of diminishing returns, both in food and cash crops such as maize, coffee and

cotton....Prolonged poor cultivation methods, particularly on the sloped mountains and highland regions have caused severe run-off of minerals and natural micro-organisms such as bacteria and worms necessary for plant growth and sustainability... Indiscriminate use of chemical fertilizers on crops.. [This] led to severe soil infertility throughout the country, causing a quantitative decline in crop yield while changing climatic conditions.

Searching for more fertile land for agriculture in many areas, forests and bushes have been cleared by farmers for farming, settlement, biomass fuel and materials for construction. All these changes made in the natural environment are reflected in crop failure, resulting in food insecurity and prolonged famines. Agriculture has become more costly as well, because the degraded environment requires the application of considerable amounts of external agrochemicals in order to compensate for the lost production capacity of ecosystems (Speranza, Kiteme and Opondo, 2009:6). Over the years sustainable agriculture, based on the realisation that human beings and nature are interrelated, has been replaced by a top-down approach which the government, with the intention to stimulate industrial agricultural methods in order to increase yields, had taken over from colonial rule.

However, Ellis-Jones and Tengberg (2000:20) argue, this approach has had little lasting effect and land productivity has continued to decline. As the land became less productive, farmers saw themselves forced to select from a range of modern farming technologies in their attempts to reverse the decline. They chose to use agrochemicals and improved seeds, most of which are hostile to the natural environment and, hence, climatic conditions were further affected. Ellis-Jones and Tengberg (2000:16) further posit that the goodness of modern farming methods can only be realised if used responsibly to minimise its impact on the natural environment and ensure that they enhance soil fertility, conserve soil moisture, and replenish ecosystems, thus regulating natural climatic conditions.

As agricultural methods shifted from ecological sensitivity in the pre-colonial period to the capitalist mode of production in the colonial era, it strengthened the dichotomy of nature/humankind and it enhanced the view of nature as a mere instrument for human gain. The desire to exploit nature in order to increase productivity and maximise profit, survived into post-colonial times and the natural climatic conditions in Tanzania, as in

other parts of the world, continued to be affected. This is well reflected in the words of Swai (1980:46):

Man has always consumed natural resources which he needs. But only in recent times has it become clear that the consumption of natural resources prompts a complex reaction in nature... now the reality has dawned that the object of labour, nature is limited and that if the delicate balance between human beings and the environment is disturbed the result can be disastrous. Thus, in such circumstances people inevitably become aware that a crudely utilitarian, profit-seeking, capitalist attitude to nature directly concerns the position of the mass of the people and affects their life, health, welfare and daily life as well as physical and mental growth.

This observation makes it clear that colonial exploitation of natural resources was rapacious rather than reproductive, bent on quick returns rather than long-term sustainability. Apart from the fact that it had a destructive effect on the soil and other natural systems, it also failed to provide for alternative forms of livelihood. It is for this reason that Shemsanga, Omambia and GU (2010:2) say: “Human development, especially industrialisation has led to an increase in GHG emission into the atmosphere that has affected weather changes.” However, for countries like Tanzania with a great dependence on natural environment-based livelihoods, it is essential that farmers should learn about the critical role of their farming practices in addressing climate change. Such understanding should lead them to adopt farming practices that simultaneously care, conserve and replenish the natural environment. The following section offers a discussion on how agriculture has become both a victim and a cause of climate change.

3.8 The impact of climate change in Agriculture

A vast amount of literature reports that climate change is changing the face of agriculture in many developing countries and will continue to do so. The Food and Agriculture Organisation (FAO, 2011:1) explains:

Historically, farmers have learned to cope with climate variability and have often adapted crops and farming practices to suit new conditions. But the severity and pace of climate change is presenting new, unprecedented challenges. The poor in rural and urban areas will be most adversely affected as they depend on climate sensitive activities and have a low capacity to adapt.

In the African context the situation is particularly serious, as the Agriculture Development Forum (ADF, 2010:1) comments:

Climate change poses important challenges for agriculture and food security in Africa. It directly affects food production through changes in agro-ecological conditions and indirectly affects growth and distribution of incomes and thereby increases the demand for agricultural produce. Therefore, a paradigm shift at all levels is needed. This means that agriculture and food security should be at the heart of sustainable development and poverty eradication efforts as well as those related to lower carbon and climate-resilient growth.

From a religious perspective, it is widely recognised that changes in rainfall patterns have caused and continue to seriously and adversely impact on agricultural performance (Religion for Peace, 2011:20). The truth of the matter is that Africa is seen as more vulnerable to climate change in terms of agriculture because of farming being the backbone of the rural economy in which about sixty percent of the African population is employed. Furthermore, agricultural production in Africa constitutes fifty percent of the total export, while its contribution to the continental GDP is twenty percent.

Besides, seasonal production consists largely of rain-fed cultivation and is thus vulnerable to climatic variability and change (ADF, 2010:2). On the basis of these realities - the agricultural sector as the largest economic sector in Africa employing many people - it is natural that climate change poses a danger to the entire African economy and, more importantly, puts the livelihoods of the majority of people at serious risk. Emphasizing this point, the International Institute for Sustainable Development (IISD, 2011:3) states; “Not surprising, agriculture is deemed to be an economic activity that is expected to be vulnerable to climate variability and change.”

Furthermore, the vulnerability of the agricultural sector to climate variability and change has been a central issue of concern to the international scientific community, as reflected in article 2 of the UNFCCC that accentuates the need for:

Stabilisation of GHG concentration in the atmosphere at a level that would prevent serious anthropogenic interference with climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, ensure that food production is not threatened and enable economic development to proceed in a sustainable manner (UN, 1992:1).

This section of the UNFCCC pleads, among other things, for the discontinuation of food production through agricultural methods that are unsustainable and that, thus far, have contributed to the problem. While agriculture is in its various aspects an essential component of societal well being, it is simultaneously a major user of natural resources such as land and water, as well as exploiting biodiversity. Generally, since agriculture uses natural resources to produce various products, there is no doubt, therefore, that the severity of climate change makes it into a prime victim of climate change. This is true for almost all countries whose economy depends on agriculture, Tanzania among them.

According to Lamboll, Nelson and Nathaniels (2011:2), the impact of climate change is not felt equally in all areas, due to the diversity of physical and geographical locations. Areas at a mid to high altitude will have varied climatic experiences compared to low-lying regions. In general, the impact of climate change on agriculture can be divided into two categories, namely direct and indirect impact. The direct effects can be further divided into four types, discussed in the sections that follow.

3.8.1 Change in biological processes

Parmesan and Matthews (2005:343) contends that climate change cause changes in biological processes for two reasons. Firstly, the exchange of carbon between ecosystems and the atmosphere is controlled by biological processes, especially plant sequestration and decomposition. Secondly, changes in vegetation patterns affect the amount of radiation intercepted near the earth's surface. This means that any increase in biomass will result in increased interception of radiation and contribute to the warming of the earth. Lamboll et al (2011:6) argue that changes in temperature, carbon dioxide levels and precipitation affects the yield of specific food crops, cash crops and the productivity and health of livestock. On the other hand, weather that is either too hot or too wet affects crop development and growth, as well as causing the development of new pests and diseases. On the same note, Pye-Smith (2011:4) assert that an "increase in temperature, changing patterns of rainfall, more extreme drought and floods, the shifting distribution of pests and diseases have and will have serious impact on food production process." This is because the natural biological functioning has been depleted by human activities, in this case by modern unsustainable approaches to agriculture.

3.8.2 Change in environmental and physical processes

This is another direct adverse result of climate change in agriculture. Since agriculture is both science and art involving the practice of tilling the earth to produce crops and to rear animals, it means that its success depends largely on the proper and healthy functioning of the physical and natural environment, regulating climatic effects in order to allow the production of various crops (Pye-Smith, 2011:16; Religion for Peace, 2011:21). In terms of agriculture, two types of environmental and physical impacts can be discerned. These involve vegetation on land and ecosystems. Extreme incidences of drought as the result of climate change are expected to lead to the depletion of land fertility, which in turn brings on low productivity of the land. On the other hand, extreme cases of floods affect not only the growth of crops and the yields, but also cause serious soil erosion due to run-off water (Conway, 2009:11).

Furthermore, ecosystems which form the base of agricultural production are heavily affected. Africa comprises a wide variety of ecosystems such as savannah and tropical forests, mountain ecosystems, coral reefs and great inland lakes and rivers. These contain one fifth of all known species of plants, mammals and birds and one sixth of known species of amphibians and reptiles. Studies indicate that all these systems are at particular risk, because quite small changes, either in temperature or in rainfall patterns, can have a detrimental or adverse impact on both crops and livestock. These systems are already under considerable stress due to cultivation, livestock grazing and other human interference with the natural environment (Conway, 2009:13). Undesirable results of climate change in agriculture are also reflected in article 1:2 of the UNFCCC (UN, 1992) according to which, once ecosystems, either natural or managed, have been affected, there will be a significant negative effect on their composition, resilience and productivity, not to mention harm done to the socio-economic system and to human health and welfare in the area concerned. In addition to this, Adam Markham (1996:186) notes:

For many ecosystems, increase in the frequency and severity and changes in the geographical distribution of extreme weather events including drought, storms, and floods will lead to some of the most serious impact on agricultural production and many more. Changes in seasonal precipitation patterns and weather variability will also be critical.

In the context of Tanzania, the unfavourable impact of climate change is said to be already noticeable in the livelihoods of people and in various economic sectors. Frequent and severe droughts in most parts of the country are already causing suffering associated with food shortages and water scarcity, among others. Emphasizing this further, URT (2007:5) mentions:

the recent severe drought which hit most of the country leading to severe food shortages, food insecurity, water scarcity, higher and acute shortage of power signifying the vulnerability of the country to impacts of climate change.

The agricultural sector is greatly affected by climate change and suffers decreased crop productions, high climatic variability and unpredictability of the seasonality, erosion of the natural resource base and physical environmental degradation. Moreover, climate change is expected to further shrink rangelands which are critical for those communities that depend on natural resources for their livelihoods in Tanzania.

3.8.3 Impact on human health

All the various impacts of climate change mentioned above contribute to the deterioration of human health to such a degree that humankind is no longer able to provide the agricultural sector with a strong and healthy labour force. Reflecting on climate change and health in Tanzania, Euster Kibona (2008:5) and Religion for Peace (2011: 22) point out that climate variability affects human health and well-being in a number of ways. This means that people's health tends to deteriorate as a result of scarcity of water, inefficient sewage systems, food insecurity and the distribution and seasonal transmission of vector-borne infectious diseases. Taking note of this further, McMahon (2013: 91) argues that although agriculture produces food to keep people alive, it has been recently acknowledged that there is always a greater potential in modern agriculture to generate diseases and toxins, both of which are detrimental to human health.

Commenting on the impact of climate change on human health, especially in the Tanzanian context, Msafiri (2012:37) mentions cases of malaria outbreaks which are

reaching catastrophic proportions, especially in the cooler regions of Tanzania such as Mbeya, Njombe, Iringa, etc. Also, Msafiri mentions the outbreak of cholera which is being experienced in various parts of Tanzania. To a large extent, argues Nestle (2010:43), these diseases and toxins ingrained in food are associated with the modern development of food production, especially the concentrated use of agrochemicals in the food production process.

3.8.4 Impact on non-agricultural livelihoods

Activities that farmers are engaged in for the purpose of supplementing their insufficient incomes or for other reasons are also affected by climate change. Lay, Mahmoud and M'Mukaria (2008:3) mention that such activities are somehow linked to agriculture and may include services, construction, mining, commerce, manufacturing and processing. If, for example, climate change has affected rainfall patterns to the extent that the growing season is shortened and therefore agricultural productivity declines, it means that the supply of food to other sectors is also hampered. Therefore those involved in providing food services such as restaurants, hotels, supermarkets and local markets, will experience shortages as well.

Apart from these direct types of impacts, indirect impacts are apparent. These are in some ways related to the agricultural sector as well. For example, decreased production of grains in a particular area may affect those specialising in cash-crops, since they are net buyers of grains (Lamboll et al, 2011:16). On the whole, unpredictable rainfall with prolonged or shortened rain periods, prolonged dry periods, uncertainty in cropping patterns, shifting of agro-ecological zones, increased competition between wild nature and crops for moisture, nutrients and light, ecological changes relating to pests and diseases and declined production are the major dangers that climate variability poses for the agriculture sector. All these highlight that agriculture has been, and continues to be, a victim of climate change worldwide, in Africa and Tanzania in particular. Apart from being a victim, a vast literature indicates that agriculture is simultaneously a significant contributor to the problem of climate change. The following section continues the discussion in this regard.

3.9 Contribution of agriculture to climate change

According to the National Climate Ethics Campaign Handbook (2011:6), although the planet is a special place capable of sustaining life due to its insulating blanket which surrounds it to maintain an average temperature that is supportive to life, human activities such as agriculture practices add more GHG, thus reducing its insulating capacity. This means that what human beings do to the natural environment has a great ramification for the natural environment and contributes significantly to climate variability. As has been alluded to earlier in this chapter, unsustainable approaches to agriculture, i.e. use of large quantities of agrochemicals, clearing of wild vegetation, adoption of monoculture, deforestation, and draining of wetlands offers a great deal of soil erosion and environmental degradation. On this basis, Ramanjaneyulu and Kuruganti (2009:7) have pointed out that climate change does not only affect agriculture, but that agricultural sector is also a significant contributor to the climate change.

Scientific studies indicate that such unsustainable approaches to agriculture have done serious harm to the natural environment that supports agricultural production. According to Rodriguez et al (2004:29), prior to the 1920s agriculture had been the leading cause for the increase of released GHG worldwide. While today this is no longer the case in the sense that other sectors have taken the lead, it is still a fact that current unsustainable agricultural methods have a detrimental effect on the environment both locally and globally, thus adding to global warming and climate change. The GHG emission inventory assessment report for Tanzania (URT, 2003: xix) states in this regard:

With respect to agriculture, in areas where rainfall will increase, the leaching of nutrients, the washing away of the topsoil and water lodging will affect plant development and yields and change climatic situation which will increase incidences of climate change that favours the occurrences of diseases and pests due to the higher temperatures and increased rainfall.

Reflecting on ‘the benefit of modern farming agriculture’ Petil Michael (2010:9) argues that, although the massive productivity of modern farming agriculture is undeniable, the question should really be: “Is such productivity sustainable?” He therefore, summarises four environmental aspects through which unsustainable ways of agriculture contribute to climate change.

These aspects include soil, biodiversity, water and GHG emissions. Agriculture contributes to global warming and climatic variability firstly through soil depletion. In this regard, Petil (2010:9), Paul, Semino and Lorch et al. (2009:2) and the Pesticide Action Network (PAN, 2012:1-2) contend that for the last five decades worldwide more than 100 million hectares of natural land have been converted into farmland. This suggests an increased rate of land erosion because cultivated land erodes at a much faster rate. Undisturbed land or forest loses between 0.005 to 0.05 metric tons of soil per hectare per year, whereas cultivated land potentially loses up to 12 to 15 metric tons of topsoil during one single rainfall. In tropical climates, such as in Tanzania, erosion rates that occur range from 30 to 40 metric tons per hectare per year (Petil, 2010:10). Anthropogenic soil erosion is strongly linked with deforestation and cultivated soil erosion. Explaining this further Minderhoud (2011:33) asserts:

When anthropogenic influence to erosion is not so prominently present, the role of climate change on soil erosion is not expected to be significant compared to anthropogenic forcing. This is mainly because the vegetation cover is no longer influenced by climatic changes but artificially by human activity. However, increasing wetness enhances erosion further, when the vegetation cover is damaged by human activity [farming activities].

It is for this reason, McMahon (2013:91) has pointed out that agriculture is a major cause of climate change. This implies that unsustainable farming methods which deplete natural land make it more vulnerable to climatic variability. For instance, in the natural situation an increase in precipitation may eventually result in a decrease in hill slope erosion due to the growth of a protective vegetation cover. However, in situations where the vegetative cover has been removed, an increase in precipitation may lead to serious erosion and other environmental degradation. Acknowledging the problem of soil depletion in Tanzania, Mongi (2008:10) argues that soil depletion occurs in sixty one percent of the entire land area in the country and unsustainable farming methods have been mentioned as one of the key factors that contribute to such depletion.

The second aspect of the agricultural contribution to the global climatic challenge is its effect on biodiversity. Biodiversity is a term used to describe varieties of life on earth. It refers to the wide variety of ecosystems and living organisms such as plants, animals with their surroundings and genes (Petil, 2010:11). Biodiversity is critical because it is a

foundation for various forms of life on earth. It is central to the functioning of ecosystems that offer products and services without which humankind and other living beings can hardly exist. Such services and products include oxygen, food, fresh water, fertile soil, medicines, shelter, protection from storms and floods, a stable climate, recreation, etc. None of these is human made and all have their origin in nature, particularly in healthy ecosystems. Biodiversity is thus a source of security and health, affecting social relations, freedom and choices (Hens and Boon, 2003:2). This means that there is a significant link between a healthy biodiversity and human wellbeing and biodiversity which is severely affected by unsustainable farming methods cannot support life in any sense. In other words, biodiversity is a safety net for all forms of life.

Therefore, a loss of biodiversity and a deterioration of ecosystem services contribute, directly or indirectly, to the worsening of climatic conditions. On this basis, MEA (2005) has pointed out that changes in biodiversity, due to human activities such as agricultural approaches, has been more rapid in the past fifty years than at any other time in the history of humanity. The drivers of change that cause loss of biodiversity and ecosystem services are either steady, showing no evidence of declining over time, or of increasing intensity. The MEA (2005) defines the situation as follows.

Among the most important drivers of climate change is agriculture with its modern farming methods. These include intensification of farming systems coupled with specialisation by plant breeders and harmonising effects of globalisation. These have led to substantial reduction in genetic diversity of domestic plants and animals in agricultural systems.

On the same note, Petil (2010:12) and the Platform for Agro-biodiversity Research (PAR, 2011:18) comment that due to unsustainable farming methods, agricultural production is declining and the ecological functions (services) on which agriculture depends are being considerably degraded. This suggests the need for protection of the biodiversity throughout the agricultural landscape, and support for the agricultural sector and farmers in particular. This new direction should be done in a spirit of involving all levels of society - local, regional, national and global. It should be driven by a clear understanding that biodiversity is a critical basis for food security and sustainability.

A third aspect is water, which is central to agriculture because it is the blood of ecosystems. Water also serves as a medium of transporting matter both inside and outside a given ecosystem. There is no farming system that will succeed without water (Hamuda et al, 2010:87-88). It is in this context that Petil (2010:12) points out that modern agriculture has relied heavily on water as a key input for any agricultural production. Worldwide, agriculture accounts for about sixty nine percent of all fresh water withdrawals, while the water demand for industries and other purposes is expanding rapidly. Agriculture contributes to the pollution of water in a number of ways. Inefficient irrigation practices in the past and present have led to water being wasted. This happens to a large extent due to reasons such as unchecked withdrawals in the upper parts of the irrigation system, poor maintenance of irrigation facilities and limited use of water saving techniques, such as drip irrigation. Most of the farming practices that can help to preserve water, such as soil cover and soil-retaining organic matter, are not widely used.

In many areas water is pumped from aquifers faster than it can be replenished, leading to a depletion of water stocks. In this situation, understanding the importance of water and improvising water management techniques in relation to farming is of paramount importance. Such a need is critical in Tanzania as Noel, Soussan and Barron (2009:12) argue: “agriculture is the largest consumer of water accounting for eighty five percent of total water withdrawal.” Furthermore, in a study conducted in 2007 to assess how to increase water productivity and management in Tanzania, especially in the agricultural sector, it was found that increasing water productivity through water conservation was a more appealing option than developing new irrigation facilities which, apart from the cost that may be incurred, would harm natural ecosystems, especially water. Increasing water productivity in agriculture requires proper management of the available scarce water resources so that they can be used by more people for the common good (Mahoo, Makoga and Kasele et al, 2007:1).

In Tanzania, proper water resource management in relation to agriculture entails transforming some of the farming practices that are detrimental to natural resources. URT (2003:6) under the Participatory Agricultural Development and Empowerment Project (PADEP) outlines farming methods that offer potentials for better water management in order to enrich the soil, increase productivity and enhance ecosystem

functioning, thus curbing climatic extremes. These include watershed management of soil and water conservation, conservation tillage, efficient use of inorganic fertilizers, fuel-efficient technologies, e.g. biogas and integrated plant nutrition strategies, and irrigation systems (URT, 2003:7-12). Contamination of water by pesticides and other chemicals does not only disrupt ecosystems, lead to possible health problems for consumers of the water and reduces productivity of the environment, but it causes harm to livestock and wildlife as well.

The fourth aspect has to do with GHG emissions in agriculture. Petil (2010:13) and McMahon (2013:91) mention GHG emission as caused by modern farming methods and as contributing to climate and change. This happens either directly or indirectly. The direct contribution of agriculture to the climate change is twofold. First is the production and application of agrochemicals which has a great potential of releasing nitrous oxide and greenhouse gas. Second is livestock production which can produce great amounts of methane gas through the ruminants and the decomposition of manure. In this regard, Walls (2006:10) contends that most of the GHG emission from agriculture results from the addition of many chemicals to the soil.

Along the same line of thought, Rodriguez et al (2004:29) point out that agricultural emission took the lead since the 1800s up to the 1920s. Although today the main source of GHG emission is the use of fossil fuel, farming practices remain the second largest source of GHG emission. According to McMahon (2013:91-92), agriculture contributes to climate change indirectly through deforestation, which alone accounts for seventeen percent of the GHG emission. This is the case because the conversion of land for agriculture involves the destruction of plant life, which leads to the release of the GHG emissions.

Rodriguez et al (2006:30) mention three other ways in which farming activities produce GHG. Firstly, it is through the burning of biomass in processes such as deforestation and the burning of agricultural residues. The burning of plants facilitates the release of gas stored in those plants (biomass). Secondly, agricultural expansion involving the clearing of land adds to the global rise of temperatures. Explaining this further, the National Sustainable Agriculture Coalition (NSAC, 2009:2) emphasizes that GHG emission continues beyond the gate farm. This is the case because beyond the farm there are other

activities such as processing, transportation, storage and distribution, which may cause higher emissions than the agricultural production sector itself, thus accounting for the third way of GHG emission. In summary, Lamboll et al. (2011:23) contend, there are three types of gas emission affecting global warming and climate change at large for which agriculture is responsible.

- Ten to twelve percent or more of the total global anthropogenic *GHG emission*.
- Fifty percent of the total global anthropogenic *methane* gas emission.
- Sixty percent of *nitrous oxide*.

Although this gas can be emitted from mobile and stationary combustion of fossil fuel, a significant amount of it is generated by such farming activities as the use of synthetic agrochemicals, animal manure management, etc. A study, recently conducted by the University of California's Department of Chemistry, as reported by Robert Sanders (2012:1-2), has affirmed that increased use of industrial fertilizer contributes to nitrous gas. The report says: "Increased fertilizer use for the last fifty years is responsible for a dramatic rise in atmospheric nitrous oxide which is a major greenhouse gas emission contribution to global climate change."

In 2003, the Tanzanian government, under the auspices of the World Meteorological Organisation (WMO), the United Nations Environment Programme (UNEP) and UNFCCC, compiled an inventory of GHG emission in the country. It was found that CO₂ accounts for sixty one percent, followed by methane gas at thirty eight percent, and nitrous oxide at one percent, all of which were emitted by the agricultural sector in one way or another (URT, 2003:9-10).

It has been argued in this section that agriculture, with a particular focus on Tanzania, is both a victim and cause of climate change. Through unsustainable modern farming methods, such as deep tilling, agrochemical concentration, deforestation, soil erosion, monoculture, etc., the agricultural sector has inflicted change on the natural functioning of ecosystems, emitting GHG and degrading the environment. In this sense agriculture is to a significant degree responsible for climate change. The end result has been a constant decrease of crop yields as a result of reduced or degraded soil fertility. For that matter, environmental degradation caused by soil erosion deposits in stream- and river- beds and in coastal waters, as well as the pollution of marine ecosystems caused by agrochemical

concentration, renders some of the modern farming methods fundamentally unsustainable.

Therefore, one cannot fruitfully address the challenges of climate change without paying particular attention to the transformation of approaches to agriculture and of general human attitudes towards the natural environment. In this regard, Schaffrut-Chatterjee (2011:1-2) argues that agriculture offers tremendous potential for the mitigation of climate change, especially if farmers can be brought to adopt climate-friendly farming methods that will increase the capacity of the soil to absorb carbon contents. Insisting on the need for a change of human attitudes towards the natural environment, Scherr and Sthapit (2009:25) contend: “human beings and the natural world are on a collision course. Fundamental changes are urgent if we are to avoid the collision our present course will bring about.”

In order for this to happen, collective efforts are required whereby every sector of life, including religion, and in this case, the Christian Church, has a contribution to offer. Given that climate change is principally a result of the human mistreatment of nature, it is vitally important that Christian faith communities recommit to the integrity of creation in all their interactions with nature, including approaches to agriculture. This is a primary requirement, Niles (1989:18) argues, because both climate change and environmental disaster are “consequences of deliberate human attempts to ‘master’ nature for human use without taking into account the delicate balance and inter-relationship that sustains the whole creation”. Such a recommitment to the integrity of creation is necessary, McDonagh (1994) adds, because:

...most modern economic patterns of production, distribution, consumption, trade and development are taxing and even breaching the regenerative capacity of the biosphere. This is a very serious indictment as it entails diminishing life on earth for all future generations of human and other creatures.

In the light of the above discussion, certain agricultural activities do cause environmental degradation and accelerate the change of climatic conditions, especially through deforestation and soil erosion, which also leads to low productivity. It becomes obvious that the Tanzania government and its development stakeholders and partners such as Christian faith communities should work together to sensitise Tanzanians and to

transform their attitudes as regards the importance of taking care of the natural environment. People must be mobilised for the employment of sustainable agricultural methods, taking on board the issue of climate change as a major challenge to sustainable agricultural development and sustainable life at large (URT, 2011:10-12).

3.10 Chapter summary

The main objective of this chapter was to describe the conceptual link between agriculture and climate change by demonstrating the interplay that exists between these two intertwined aspects of this study. This was important in order to understand how unsustainable approaches to agriculture add to the problem of climate change and, in turn, what impact climate change has on the world of agriculture. In the first place, this chapter has attempted to show the critical role that agriculture plays in relation to sustaining life on earth, including its evolvement. The second point of discussion has been to pinpoint the link between agriculture, the natural environment and the economic system. In this regard, it has been argued that farming as an economic activity, operating in a market-based economic system, needs a healthy natural environment in order for it to succeed. This suggests that unsustainable approaches to agriculture such as largely modern methods, affect economic growth especially in the light of climate change. Finally, it has been argued that climate change affects biological processes, changes the natural environment, and impinges on human health systems and on various non-agricultural livelihood options. At the same time, modern agriculture, through its key features such as monoculture, deep tillage and agrochemical concentration, changes the natural functioning of ecosystems, emits different types of gases (GHG, methane and nitrous gas). As unsustainable human practices interfering with nature have led to climate change, it is important that every sector of life, including Christian religion, contributes towards creating a sustainable future by transforming human attitudes towards the natural environment and thus mitigating the challenge of climate variability and change. The question of how such a transformation could happen, as well as a theological reflection on the contribution of theological discourse on the problems of environmental disaster and climate change, will be explored in chapter four of this study.

CHAPTER FOUR

THEOLOGY: A PROBLEM AND PROMISE FOR LIFE-GIVING AGRICULTURE IN THE CONTEXT OF CLIMATE CHANGE?

Much Christian and Western thought has led to the radical alienation of man from nature. Greek idealism, Gnostic dualism, neither wholly concurred in medieval theology, Germany idealism, all have contributed to this alienation. All [have] attempted to rescue man from his oneness with nature and to exclude nature from a history of salvation... (Frank Moore Cross)

4. 1 Introduction

In chapter three, an attempt was made to demonstrate the conceptual link between the world of agriculture and climate change in response to sub-question three of this study. This was achieved by articulating the interplay that exists between agriculture and climate change. It was argued that although agriculture is affected by incidences of climate change, it is also one of the significant contributors to climate change, especially through the deployment of methods that are environmentally insensitive. Using the first principle of the ecological transformation i.e. unmasking pathological earth, chapter four offers a discussion about how theological discourse has had an influence on unsustainable approaches to agriculture that affect the natural functioning of ecosystems and exacerbates the problem of environmental disaster and climate change. In this way the chapter will demonstrate the link between climate change, the world of agriculture and theological discourse. The chapter begins by pinpointing how the three aspects are linked together and goes on to articulate how theological discourse has had a decisive influence on how humankind views the created order. Finally the chapter argues for tilling and keeping as an agro-theological metaphor and helpful resource on sustainable agriculture in the context of climate change.

4. 2 Climate change, agriculture and theology:

The link between climate change, agriculture and theology can be traced back to the creation story where human beings are envisaged as “land’s servant performing the duties demanded by its power and processes” (Davis, 2009a:43). According to Wirzba (2003:129) this is opposed to the popular understanding which profiles human beings as those who are divinely authorised to irresponsibly dominate the earth without broadly understanding the expected characteristics of domination. Human beings are supposed to live a life of humility on earth, which means an adherence to the grace of life as engraved in the natural environment (Wirzba, 2003:138). Moreover, the link between theology and agriculture is also based on the God given mandate to till and keep the earth, which can also be inferred as serving the earth. Understood from the agricultural context, it suggests the importance of acknowledging that the earth has power over human beings because the survival of humankind cannot be possible without the earth. This means that human beings can only define their health and well-being in terms of healthy ecosystems and thus integrity of God’s created order.

Such a link between agriculture and theology makes it imperative to understand that the current ecological crisis evidenced through incidences of climate change has its roots in theological discourse. It is for this reason that Davis (2009a:115) postulates “ecological crisis is at root a theological crisis, the crisis in our relationship with the God who made the heaven and earth.” For this reason it is widely acknowledged that climate change is a product of environmental degradation resulting from unsustainable human activities within the natural environment, especially unsustainable approaches to agriculture. This reality is well echoed in the UNFCCC (UN, 1992:2),

...the states have... the sovereign right to exploit their own resources pursuant to their own environment and development policies and the responsibilities to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction.

In this quote, the UNFCCC calls all nations to ensure that natural environment is used kindly. This allows, adds Davis (2009:8b), for maintaining the fertility and habitability of the earth for all creatures. In other words, humankind needs to have a sustainable

relationship with earth through which all lives depend. When humankind does not have a sustainable and responsible relationship with natural environment, as it is indicated in the biblical literature, thorns and briars abound (Gen.3:17-19), rain is withheld (Deut. 11:11-17; 28:24) and the earth languishes and mourns (Isa. 16:8; 33:9; Hos. 4:3).

It is further noted in the United Nation document known as Kyoto Protocol (1996) article 10 (c) that in order to prevent and mitigate the adverse effects of climate change, countries are encouraged to formulate policies and establish programmes using environmentally sound technologies. Affirming this further, Bohringer (2000:5) contends that climate change caused by anthropogenic GHG emissions has emerged as one of the most critical environmental issues facing the entire world community today. Furthermore, Hessel (1996:1-2) argues that environmental degradation has been on top of the list of social injustices and is already causing massive suffering among the living beings on earth, especially through the impact of climate change. Similarly, Bohlin (2009:1) and Attfield (1983:1) support the assertion that the manifestation of the problem of climate change is seen through the destruction of the natural environment, global warming, endangered species, the destruction of wildlife, the destruction of rain forests and nuclear accidents, the endangering of life-support systems on the planet, and the loss of cultivatable land through erosion and the growth of deserts. Most of the non-renewable minerals, forests, wilderness and wildlife are being exhausted.

Moreover, Tobin (2009:4) asserts that human beings are the major cause of the problems of climate change through the various economic activities that exploit the natural environment which, in turn, worsen climate change. Emphasizing this further, Hathaway and Boff (2010:5-6) argue that human beings have destroyed nearly half of the great forests that serve as the lungs of the planet. This has raised the global temperature by an average of 0.5⁰C, contributing to global warming. It shows that the ways in which human beings relate to the natural environment not only result in a degraded environment, but also contribute hugely to climate change which places life on earth at serious risk. Thus, it is suggested that through climate change and environmental degradation, humankind has proved to have the capacity to adversely transform the natural functioning of earth.

The seriousness of the problem demonstrates that after the three great global revolutions, i.e. agricultural revolution, industrial revolution and information revolution, the global community is currently facing the ecological revolution as the fourth

revolution (Hessel, 1996:4). While the former revolutions transformed and reorganised society so as to produce more effectively, the ecological revolution calls society to produce without being destructive to the natural environment that supports the production. It is on this basis that Boff (1995:9) urges humankind to review its scientific advancement and the art of interaction with the natural world. This is necessary because nature, from a small particle and primordial [very basic] energy to a more sophisticated form of life, is dynamic and comprises a “complex network of connection on all sides.” Ecologically-speaking, everything is related to everything else in all respects. Such a seriousness of the problem of the environment and climate change calls for an interdisciplinary approach and every sector of human life has something to contribute towards addressing the challenges. In this regard, consensus has been emerging among scholars that the problem of climate change and the environmental crisis are too important to be left to the scientist alone. In the light of this reality, the Lutheran World Federation (LWF, 2009:7) insists that climate change is more than just a scientific concern, rather it is a phenomenon that goes to the root of Christian faith and spirituality, challenging the way that human beings view and interact with the God’s created order.

Without exclusion, science and religion are equally challenged by the environmental and climate change problems and thus scholars are called to re-evaluate their views on the natural world and their dialogue with each other (Gottlieb, 2006:376). The unsustainable relationship between human beings and the natural environment means that human beings have mistreated God’s created order to the extent of disturbing its natural climatic conditions. Given that religion (theology) deals with the questions of the purpose of life, among others, it has the potential of helping humankind to re-look at “why we should do what we need to be doing” (Gnanakam, 1999:6).

As discussed earlier in this chapter, there is a significant relationship between climate change, the world of agriculture and theological discourse. Theologically reflecting on humans’ relation to nature, Mwambazambi (2009:22) maintains that, in the African context, whether one is a Christian or not, the understanding of the world and the human relationship to the natural environment has religious grounds and a theological basis. This is the case because most Africans believe that it is God who is the Creator of everything. Likewise, O’Coinaire (2008:21) adds that at the centre of most religions,

especially Christianity, is service of life. Since climate change and environmental degradation threaten life security, integrity and sustainability, it becomes a theological concern just as it is also a scientific concern. This means that ecological crisis, manifested through challenges posed by climate change, is at the heart of Christianity because it involves the doctrine of creation and theology of life. It is for this reason that LenkaBula (2009:40) states:

... to live in relation to the earth and God's creation and to care for life is a central expression of the witness and mission of the Christian faith. The respect for integrity of life has roots in the understanding that life is a gift from God. It is also based on the notion that the household of God [the entire earth], was created to be good.

In this regard, Ayre (2008a:2) argues, "...every exposition of the doctrine of God as Creator and of the world as God's good creation is profoundly challenged by the ecological crisis." Apart from individual scholars, religious institutions also recognise climate change as linked to theological orientation. For example, the SACC (2009) recognized that climate change as a result of environmental degradation is a critical threat to the sustainability of life on earth. Similarly, the Fellowship of Christian Councils in Southern Africa (FOCCISA) had a profound stance around issues of ecological debt and climate change as issues that stand at the heart of theological reflections. FOCCISA also reflected on the engagement and the role of the Church on issues of ecological debt and climate change (SACC, 2009:82). Similarly, the World Council of Churches (WCC) offered a critical statement on eco-justice and ecological debt in 2009, urging the global community to work together towards addressing the problem of global warming as the result of a degraded environment due to unsustainable economic systems. They all agree that climate change is both an environmental and a theological problem.

Along the same line of argument, Bishop (2012:8) reiterates that climate change and environmental challenges are linked to theological discourse on the basis of the doctrine of creation, the sustainer of life. The doctrine of Creation reveals the purpose of God's creation to be exhibiting his glory, to be his temple, to populate it with life and to be the arena of comprehensive redemption, not only for human beings, but for the non-human beings as well. Moreover, the focus of *missio Dei* is to make and sustain both heaven and

earth by bringing redemption to a new creation on the basis that He (*sic*) loves the world. In this sense God's salvation means creation healed or restored (Snyder, 2005b:3).

The views and propositions reflected in this section are seen as some selected issues which add to the continued debate that ecological crisis, a basis for climate change, is also a theological concern that needs theological response. Given that this study explores ways through which an African Christian ethic of care can be cultivated in order to promote sustainable agriculture in the context of climate change, it is worthwhile reflecting on how theological discourse is both a problem and part of the solution to the current ecological crisis, especially by looking at how it has impacted on humankind's view of the natural world and it has influenced their attitudes and unsustainable practices towards nature, as discussed in the following section.

4. 3 Theological underpinning of climate change: An agrarian perspective

The influence of theological reflection on human attitudes towards the natural world is not new. According to Taylor (2005:1735), the 1967 article "The historical roots of our ecological crisis" by Lynn White, an American historian, did not only provoke discussion among theologians and biblical scholars, but also awakened and opened avenues of scholarship and inquiry regarding theological underpinnings of ecological crisis that exacerbates climate change. In this article, it is argued that Christianity cannot be entirely innocent when it comes to the question of the current ecological crisis. This is the case because through its Western oriented teachings and theological reflections, Christianity has greatly influenced the unsustainable relationship between humanity and the natural environment.

In developing this argument further, Davis (2009b:1) points out that it is such long standing theological orientation that form the basis for the current global dominance of modern agricultural methods, which are unsustainable. Moreover, Beyer (1994:206) affirms that most religious actors, especially Christianity and church leaders are becoming aware of the contribution of religion in the current problems of climate change and environmental crisis. It is on this basis that White's article began to disclose the illogic and danger of such theological aspects that do not consider the health of the earth and of the living creatures.

Reflecting further on White's article, Taylor (2005:1735) points out that his work was informed by his long study on the development of medieval technology and its impact on medieval society, in line with Christianity. In this case, White identified two major ways through which Christianity has contributed to current ecological concerns. The first aspect is the development of science and technology. White (1967) believed that the Middle Ages were a decisive period in the emergence of Western technological supremacy, and medieval Christianity provided a unique activist character which formed the spiritual foundation of the modern technological intervention.

The second aspect is the anthropocentric nature of Christian theology itself. To justify his position on this aspect, White traced broad elements within the Judeo-Christian tradition which ascertained how this influence was forged. Among these elements was the biblical divine mandate in Genesis 1:28 which has been interpreted as providing humankind with dominion over nature. This was coupled with the anthropocentric doctrine of salvation of the human soul on the basis of which destruction of pagan animism was performed and the notion of the matter as inert (lifeless) material was emphasised.

According to Malpas (2007:19) this is an overemphasis on human nature that positions humankind above all on earth. This kind of understanding does not factor in the complex relationship in which human being lives and are involved (Malpas, 2007:22). Three dimensions of human dignity and human well being are said to exist, i.e. a sense of dignity and well being obtained in terms of "relationship with ourselves," with others and with a wider world. Therefore, technological advancement, anthropological theology and missionary influence are the major aspects of Christian theology that are believed to have had a major influence on people's views of nature, based on White's thesis. Each of these aspects will be discussed separately in the following section.

4.3.1 Christian theology and the emergence of science and technology

According to Lynn White (1967), Western monasticism, which is one of the Christian expressions, has specific characteristics that have fundamentally promoted a Western technological development. Analysing this further, White goes on to argue that Western

monks believed work was an essential form of worship and was embodied in the rules that governed not only their lives but also their practice of faith. In addition, monastic communities spearheaded new technology, which is reflected in the ways that they constructed sophisticated buildings and other infrastructures for various purposes. Unlike Byzantine construction technology, the western monasteries were well equipped with mechanical technologies such as clocks and musical instruments such as organs which were considered to be the most complex machines in the Middle Ages.

Moreover, in the study of medieval history, White discovered that Christians of the Middle Ages used a rotary grindstone driven by mechanical cranks to sharpen their swords that were used as weapons (Taylor, 2005:1736). These are the few but important indicators which demonstrate that deep-seated values embedded in the Judeo-Christian tradition made the pursuit of technology appear morally virtuous. As a result, this led not only ultimately to Western technological dominance but also to the continuing impact on the environment as humankind took an aggressive stance towards nature, through the use of technology.

Something worth noting in this argument is that during the Middle Ages, religion became the most important force that shaped the society and that, although religious values operated below the level of conscious expression, they had a direct effect on human behaviour and became the most effective antidote of environmental degradation and climate change today (Taylor, 2005:1736). In general, Lynn White's argument is that Western Christian religion, unlike most traditional religions in other continents, has influenced exploitative human attitudes towards creation by uncritically supporting the inappropriate utilisation of technological innovations (White, 1967).

Bekar and Lipsey (2001:2) are in line with White's argument as they point out that the development of science and technology was a pre-condition of the Industrial Revolution, and often blamed as having a huge negative impact on the natural environment, while continuing to be the vehicle of exploiting creation even today. However, there are institutions that grew and evolved to support and contribute to the development of these technologies. Among these institutions is Christianity. In the early days, when Christianity was the religion of a minority, little influence could be seen, especially during the first four hundred years, until it became the official religion of the Roman Empire

(Bekar and Lipsey, 2001:5). As Christianity grew, the early Church fathers adapted the sophisticated Greco-Roman culture within which they operated. The scientific innovations of this culture were perceived as neither good nor bad, and hence Christianity uncritically absorbed these technological developments. Commenting on this, Chapp (2011:140) points out that the modern world's conception of reality through innovation and technology occurred interfaced between Christian faith and the rise of science and technological development.

According to Bekar and Lipsey (2001:6), there were two doctrinal debates in those days: occasionalism; and naturalism - both questioning God's place in day-to-day affairs of the world. The doctrine of occasionalism was advocated by Christianity, where the emphasis was that God is occasionally responsible for all day-to-day occurrences in the world. On the other hand, the doctrine of naturalism was another version of religious doctrine with its origin in the Greek worldview. This doctrine claimed that God created the world according to natural laws, and then endowed human beings with free will to determine their own affairs. In other words, it was believed that God is not concerned with the world at all. This means that after creation, God was not involved in the world but humankind alone. After years of debate on these two religious positions, argue Bekar and Lipsey (2001:7), Christian thinkers abandoned the doctrine of occasionalism and adopted naturalism, which emphasised that nature exists independently. Gradually, Christianity continued to promote human development and issues of the natural world were either ignored or given little attention.

Furthermore, John (2009:1) attests that after medieval science and technological development, modern science emerged in the 13th century when Christian theologians crystallised and projected the theology of creation to be both rational and contingent. According to this theology, it was accepted that creation has its own laws unlinked with God, and that in order to know nature, it is necessary to study it as it is. Based on this belief, modern science was able to embark on the investigation of nature's functioning. It was on this basis that theologians such as Nicholous Copernicus and later, Galileo, emerged with the idea of the heliocentric nature of the solar system as opposed to the geocentric - a traditional and biblical understanding of the cosmic nature. This new understanding brought conflict between the Church and science, and henceforth the Church was perceived as the oppressor of science (John, 2009:2).

As in the medieval period, modern science and technology continued to have an increasingly mechanistic approach to nature. This has characterised Western thought ever since, with people longing to find techniques by which the powers and energy of natural species may be utilised so as to make humankind a master and processor of the entire creation. This desire, which to a larger extent has been achieved in the contemporary world, has turned out to be a major cause of the current ecological crisis, including climate change (John, 2009:3). While modern science and technology continued with the mechanistic treatment of nature, Christianity did not remain silent. Having been pushed by science to the realm of mythology, it was forced to work hard to gain recognition and authority in a world seeking material happiness. In this struggle, Western Christianity entered into a competition with science and technology in an attempt to satisfy the growing demand for happiness. On this John (2009:4) says:

Christianity began to encourage human beings to become masters and processors of nature in the name of either Bible which seemed to present God as ordering man to dominate the earth or spirituality which exalt human rationality as a divine image in man over the debased and sinful materiality on the rest of creation.

This indicates that although religion and science opposed each other in various ways, they also collaborated to a great deal, albeit unconsciously, for the destruction of God's creation. On the basis of this influence, the western anthropocentric view of nature has been perpetuated where natural environment is seen as existing only to serve human ends (Gnanakam, 1999:20).

These developments were compounded further by the emergence of the Enlightenment. According to Blackaby (1998:2), although it was not an organised movement, the Enlightenment was recognised as a pervasive mood of free thinking and critical questioning which spread throughout Western society from the 17th century onwards. In this period, traditional sources of authority, such as the Church and the Bible, were highly questioned. No idea could any longer be held as sacrosanct (untouchable/holy) or beyond the arena of criticism. Free examination of all religions and intellectual positions were the major characteristics of the Enlightenment, as opposed to the slavish (unquestioning) adherence to the orthodoxies and pieties of the past (Blackaby, 1998:3). In concurrence with Blackaby, Wirzba (2003:119) has pointed out that generally, Western

religious tradition “has not been always very welcoming of ecological insights” because of their anthropocentric worldview.

There was a widespread confidence regarding the power of human reason during this period. It was an optimistic period concerning the future, with a strong belief in development, and an almost unlimited faith in the power of human beings to eradicate misery, and to eventually be able to create earthly happiness through the persistent application of human reason and will, to the solution of human problems (Blackaby, 1998: 4). Being obsessed with Christianity, which claimed to have privileged access to the truth, the Enlightenment tended to acknowledge a rational doctrine of God on the one hand, whilst seeing the world as a sphere of human endeavour on the other hand. The Enlightenment considered itself to be a clean break from a corrupt, benighted, and barbarous past (religion), whilst inaugurating a period of radical change, freedom, and progress (Blackaby, 1998:5).

Northcott (2001:32) points out three other elements coupled with science and technological domination that have had a decisive influence on the human oppression of the created order: firstly, the patterns of gender oppression and domination which have impacted humanity’s relationship with other species. It is on this basis, argues Rakoczy (2004:299), the current generation witnesses and will continue to witness a massive ecological degradation manifested in global warming, water shortages, extinction of species, deforestation etc. Secondly, the renaissance affirmation of human beings as the measure of all things, and hence, a loss of respect for God’s creation; and finally, the rise of individualism and materialism, with their focus on material achievement in this life as the locus of all human good and purpose. These three elements further increased the human desire to exploit the natural world to attain progress. Such early developments show that Christianity, which was so influential in Western culture, did not maintain its prophetic position of advocating for both the integrity of creation, and the responsible use of technological innovations. It is for this reason that Simkins (2008:2) says:

Christianity provided the conditions for the democratic fusion of science and technology that enabled us to alter our environment radically and permanently. In these early developments this began to happen when Christianity de-sacralised and demystified nature. By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects.

Simkins (1994:3) further argues that because modern science and technology developed along with Christian attitudes of humankind's transcendence and superiority over nature, any further sophisticated science and technology is not likely to solve the problem of environmental damage and climate change. Moreover, Christianity, which stands at the root of the problem and continues to justify human misuse and abuse of God's creation, needs to be transformed from its anthropocentric attitude, and to consider the whole creation as a field of its mission. In principal, non-human creation is not simply material substance for human consumption. Rather, it is independent of humankind and was designed primarily for the glorification of the creator. Moreover, theologians and biblical scholars have largely ignored the role that the natural world plays in biblical religion. Instead, they emphasised God's activity in and on behalf of human history. On the basis of this understanding, the Bible is concerned exclusively with human salvation.

Scholars regarded the natural world as merely the stage for historical drama, the natural world serving as a passive instrument that God could utilise in the actualisation of history's divine plan (Simkins, 1994:6). In addition, Simkins (1994:11) highlights the role played by the natural world in shaping the religion and culture of human beings, the human attitude towards nature being only a recent focus of theological discussion and scholarship. Most theological and biblical studies preclude this focus by interpreting the Bible from an exclusively historical perspective. Underlining this further, Rogerson (2010:21) insists that the Christian anthropocentric view of nature is evident from the emphasis of God's revelation to Israel through historical processes and traditions, rather than through nature. This downgrading of the value of the natural world is based on the claim that the natural world played an insignificant role in developing and shaping human history.

In light of this, argues Austin (1991:35), it is undoubtedly clear that environmental problems have continued to pose a great threat to human welfare, all forms of life on earth, and the sustainability of the planet. This offers a significant challenge in re-evaluating the current situation, and in re-thinking the responsible use of technology and science. Describing this in a more concrete way, Theodore Hiebert (1996:23), in his article "Rethinking traditional approaches to nature in the Bible", argues that past biblical and theological scholarship was controlled by some unreliable ideas. Such ideas included the understanding that biblical religion is not about nature but about humankind and its history of salvation. Following this line of thought, McAfee (1996:31) reiterates that

biblical scholarship on issues of the environment has long been marginalized and was embarked upon for the first time by American historian, Lynn White, in 1967, as reflected earlier. Furthermore, Jacobson (1996:45) has identified six entry points that can guide Christian faith communities, biblical scholars, and theologians to re-consider their stance towards a sustainable relationship between human beings and the natural world. These are: God's judgement on the goodness of creation; the image of God to rule and serve the earth; jubilee; God's covenant with the entire creation; humans to live according to the divine plan and intention for creation; and finally, the human role in and with the natural world in the context of salvation, promise, and hope. This, adds Thompson (2010:189), makes creation care a matter of faith.

4.3.2 Anthropological theology and creation

Apart from theological influence on technological advancements, another theological aspect through which Christian religion has and continues to contribute to the environmental crisis that results in climate change, is the anthropocentric nature of Christianity. According to Stead (2010:13) and Lynn White (1967:1), Western Christianity is the most anthropocentric religion that the world has ever seen, which for centuries has insisted that it is God's will that humankind exploit nature for self-gain. This claim has biblical grounds, where human beings are granted the power of dominion over the rest of creation, hence encouraging people to over exploit nature for their own ends. Additionally, the Christian doctrine of creation tends to provide a particular privilege to humankind in the sense that human beings are the only living organisms created in the image of God, and who alone are entitled to salvation (Conradie, 2011b: 1; Gnanakam, 1999:51).

In this regard, Wirzba (2003:123) states:

Of all scriptural text, Genesis 1: 28 has played the most determinative role in shaping our understanding of humanity's place within creation. The command given to Adam and Eve that they 'be fruitful and multiply, and fill the earth and subdue it, and have dominion' over everything, has been a choice text for all who wish to claim humanity's role of master and judge over the earth.

Such biblical interpretations have led to the conclusion that because non-human creatures do not have eternal souls, it does not really matter how they are treated. Clearly, it is not wise to just read off "from our own expectations of what our lordship should

be”, rather “we must attend to the divine intention of lordship upon which our own lordship should be patterned” (Wirzba, 2003:124).

While Simkins (2008:3) argues that the anthropocentrism of both biblical and Christian tradition places humankind at the centre of creation, separating him from nature, Stead (2010:13) identifies three anthropocentric elements divinely mandated on humankind in the biblical creation narrative of Genesis 1:26-28: human being in the image of God; the mandate to rule; and the mandate to subdue the earth. It is these elements which have been the basis for the exploitation, oppression, and abuse of the rest of creation. It is this influence that has turned human being to be both “irresponsible stewards and opponents of the creator” because in their daily dealings with natural environment, they have always tended to work against God’s plan for good creation (IRCPT, 2012:5).

Explaining this further, Yu Mouchang and Yi Lei (2009:1) point out that biblical and theological anthropocentric interpretation creates a separation and tension between humankind and the rest of creation; suggesting that only humans have value and that other life-forms do not. This implies that because human beings alone have goals, they are the only creatures that are entitled to receive moral treatment and to enjoy moral rights based on aspects such as reason, self consciousness, self-control, and the ability to communicate. Moreover, the anthropocentric mentality causes humans to become utilitarian, selfish consumers and individualists, a state of being in which economic development and economic growth are the only goals - often at the expense of nature (Mouchang and Lei, 2009:2).

In addition, argues Ayre (2008c:79ff), such an anthropocentric approach to biblical texts and theological discourse has continued to devalue the intrinsic value of creation and to sanction the over-exploitation of natural resources. It is an approach that places humankind at the centre of experienced realities, forming part of integral exploitative systems, leading towards the damaging domination and devastation of the earth community. Since the global community is currently facing tremendous challenges of environmental degradation that result in climate change, it becomes necessary for Christian faith communities to ensure that they adapt some biblical principles that allow them to be responsible care takers of the earth.

Traditionally, Christians have been caught in the trap of thinking that there is a choice between caring for people and caring for creation. From the biblical perspective, the two aspects are inseparable. Caring for people requires caring for the natural environment because abuse of it will have disastrous implications for humankind (Challenge, 2009:5). This means that in a context where climate change and environmental destruction have become life-threatening, Christians should adopt and support an ecological-economic model: “the one in which our well-being is seen as interrelated and interdependent with the well-being of other living beings and earth processes” (Challenge, 2009:9).

The situation of climate change, especially in farming communities, calls for immediate personal and collective action to comprehensively re-think human engagement with the natural world. Understanding how the anthropocentric position has failed to create harmony between the natural world and human beings is imperative. This is critical, argues Ayre (2008b:1), because Christian theology and mission are not innocent of environmental degradation and climate change as they have tended to take the anthropocentric position.

Reflecting on this concern in his article “A famine of hope: Christian mission and the search for a sustainable future”, Bookless (2010:2) insists that in order to reverse the current situation of climate change, human beings must begin by recognising that they are but one amongst millions of species on planet earth, and by seeing the need for mutual interdependence in order to attain sustainability. In other words, the current relationship between human beings and the natural world is not sustainable.

Linera (2010:1) further argues that, traditionally, human beings have seen themselves as supreme beings of the entire creation, and have developed an attitude of seeing the natural world as a mere object. Linera goes on to say:

...man, even in our religious traditions, has been made a master of the universe, master of all things that have been created. Thus, the idea of reflecting upon man as being just a minute part of the whole creation, as a speck among millions of creatures, united and interdependent with them, seems a little bit far-fetched.

This suggests a transformed theological understanding that recognizes human beings as responsible managers - not the owners of God’s created order - where a peaceful and

harmonious life is experienced. In this regard, Pope Benedict XVI (2010:10), during the celebration of the World Day of Peace offered this remark:

If you want to cultivate peace, protect creation. Respect of creation is of immense consequence, not least because 'creation is the beginning and the foundations of all God's work and its preservation has now become essential for pacific co-existence of mankind.' Man's inhumanity to man has given rise to numerous threats to peace and to authentic and integral human development - wars, international and regional conflicts, acts of terrorism, and violations of human rights. Yet no less troubling are the threats arising from the neglect - if not downright misuse - of the earth and the natural goods that God has given us. For this reason it is imperative that mankind renews and strengthens 'that covenant between human beings and the environment which should mirror the creative love of God, from whom we come and towards whom we are journeying'.

This calls for reconciliation, justice and peace that will forge harmonious living on the planet earth. Since the earth holds a 'vital force' for life of all, in order to protect such life there is a need to protect the integrity of the entire creation. To make this emphasis more concrete, His Holiness Pope Benedict XVI (2011) further states:

I ask all members of the church to work and speak out in favour of an economy that cares for the poor and is resolutely opposed to an unjust order which, under the pretext of reducing poverty, has often helped to aggravate it. Some business men and women, government and financial groups are involved in programmes of exploitation which pollute the environment and cause unprecedented desertification. Serious damage is done to nature, to the forest, to flora and fauna and countless species risk extinction. All of this threatens the entire ecosystem and consequently the survival of humanity. I call upon the church in Africa to encourage political leaders to protect such fundamental goods and water for human life of present and future generations and for peace between peoples.

This an indispensable voice for which all well wishers are to turn to, reflect on their life style, both social, religious and economic systems and structures that disregard the integrity of creation while taking measures of transformation.

4.3.3 Missionary influence on the anthropocentric attitude towards nature

Looking at the creation as whole, it becomes evident that it is not God's afterthought; rather it is an indication of what God has ordained as a complete life. This suggests that when integrity of creation is not respected, life becomes incomplete. God is a covenanting God who has invited and works with humankind to ensure that the perfection of creation is sustained (Wirzba, 2003:18). Traditionally, this covenantal relationship has been marginalized throughout the history of Christianity where the whole notion of salvation is understood as removal from the world rather than the restoration of the entire created order. Explaining this further, Wirzba (2003:19) contends:

This view, however, seriously undermines scriptural sense that God's redemptive purposes are worked out in the creation rather than apart from it. God serves people of Israel not by plucking them out of their history but by restoring them within their history. [This] restoration [was] made possible either by deliverance from those agents who oppress them or through internal reformation in the light of divine justice and mercy. The aim of salvation is to create a space in which the joy and peace of God's creation can be experienced and shared. The attainment of salvation demands that those forces which undermine creation- violence, greed, suffering, jealous, pride- [must] be confronted and overcome.

In this way, humankind and nonhuman beings are called to live in harmony, thus serving as instrument in achieving God's purpose of restoring and sustaining integrity of life. In the African context, the problem of the dichotomy between human beings and the natural world is believed to be linked with missionary work during the process of planting the Church in Africa. During this period, the emphasis was on the contrast between heaven and earth, spiritual and material, soul and body, etc. Munyika (2004:294) argues that such contrasts have led people to view this world as evil and as something that needs to be endured rather than embraced, taken care of, enjoyed and sustained. As a result, people tended to ignore the reality of human beings' interrelationship with the rest of creation. People became distracted from paying attention to the challenges of daily life and from their responsibility over the natural world. Similarly, Oduyoye (nd: 241) makes it succinctly clear saying:

Modernisation has had a disruptive and weakening effect on African life and religion. At the same time, it is evident that the missionaries' religion together with modern technology has proved inadequate to our needs. Since the old appears unable to stand on its own and the new, by itself, is proving inadequate, we should expect some creative syncretism to develop in Africa.

In line with Oduyoye, Ezra Chitando (2005:181), reflecting on “missionary attitudes towards African Traditional Religion (ATR) and Hinduism”, contends that ATRs that explain the African worldview have suffered marginalisation from both missionaries and scholars for many years, when he says:

The current low status of ATRs in the academic study of religion is largely due to the tendency by missionaries to minimize the indigenous traditions of Africa. Although they made useful contributions to the study of ATRs, particularly through recording the observations relating to local beliefs and practices, missionaries often created and deployed negative images of ATRs.

This has been the case because the central focus of the early missionaries was the conviction that individuals and communities in various parts of the world should be incorporated into the Christian faith, especially into the Western expression of Christianity. In so doing they have functioned in the paradigm of exclusivism (Chitando, 2005:183). On the basis of such paradigm, Western Christianity was presented as the only true revelation, while indigenous beliefs were perceived as mere superstitions. In this process, even indigenous veneration and respect for the natural world was condemned as ungodly. As Chammah Kaunda (2010:26) points out, these missionary attitudes towards African culture were informed by the Western worldview, based on the Western modernity and scientific revolution characterised by the claim on Western humans' power of reason and rationality in making life better (enlightenment). So gradually, their sharp dichotomy between body and soul, heaven and earth, and human and nature began to take roots in African soil (Kaunda, 2010: 27).

While Oduyoye, Chitando and Kaunda, as discussed above, appeal to Western missionaries to cease the downplay of African culture that linked people to their natural environment, Mwikamba (2000:32) puts forward some positive and helpful elements of African culture in addressing issues of climate change and environmental degradation which were undermined by Western missionaries:

The respect of nature is deeply rooted in African traditions. These traditions are striking for their sense of numinous in the created world. The divine presence in nature is remarkable and to be in harmony with nature is to live in contact with the deep sources of divine life. Man... is not there to merely manipulate creation, but to acknowledge natural dependence upon the powers of collation and the need to be in fitting relationship to the powers.

In line with Mwikamba, Kyomo (2000:58) expresses a similar argument when he insistently points out:

Traditional African worldview understands God (the Supreme Being) as the original source of life. This life occupies the whole physical world. It is the responsibility of every individual to preserve this life which is represented by the living and non-living...one remains healthy in a holistic sense only by living in harmony with the whole creation. Abundant life is achieved only when effective healing involves reconciliation with the entire cosmos.

All these arguments suggest that before missionaries' arrival, there existed some elements of wisdom that enabled Africans, in this case Tanzanians, to recognise that their life sustainability was integral to the health of the entire creation. This is particularly true given that most Africans produced food from the natural environment through farming activities, and hence could easily develop mechanisms to ensure that the fruits of the earth continued to prevail. Reflecting on the impact of colonialists [missionaries] on African indigenous agricultural systems, Masoga and Kaya (2012:25) contends that European colonialists and missionaries tended to regard:

...an African indigenous farmer as useless, too lazy or ignorant to conserve the soil through fertilisation and prevention of erosion. His/her interaction with land has been held to be predatory, never actively improving it but exhausting it through thoughtless tilling.

Contrary to this colonial view of African traditional farming practices, Masoga and Kaya (2012:35-36) attests that pre-colonial societies practiced sustainable farming because they were cognisant of life engraved in the health of the natural environment. In his words he points out, "indigenous African agriculturalists operated different systems of relative permanency. There was a people-land relationship which ensured a successful control of the ecosystem" (Masoga and Kaya, 2012:36). All these influences by missionaries [colonialists] suggest that the planted Church has continued to nurture the same anthropocentric attitude towards nature. The fact that climate change is an

environmental problem calls the Church to revisit its mission and doctrine of creation as a whole, especially in farming communities whose life sustenance lies in the health of naturally functioning ecosystems.

Recognising such a need for the contemporary Church, Mwikamba (2000:32) argues that the mission of the Church cannot be reduced to humankind alone. It has to go beyond preaching the gospel to all nations and to encompass the whole creation in the preaching, as echoed in Mark 16:15. Furthermore, Mugabe (2000:32) insists that in traditional African societies, even the concept of salvation is understood holistically. It is about the protection, restoration, preservation, survival, and continuance (sustainability) of human society and nature.

Reflecting further on the understanding of salvation, in the Akan community of Ghana, Mugabe (2000:33) points out that the community perceives salvation as the well-being of the entire community, the absence of everything that threatens any form of life, and holds that it is about restoring or preserving human beings' harmonious relations with creation in order to allow the rhythm of life to go on undisturbed. Such an understanding of salvation was not taken into consideration by missionaries as they planted the Church in Africa.

This affirms that contemporary Christianity came to Africa in a Western costume and there was no synthesis with the context in which it was planted. The African worldview, which is communal in nature, was depicted by Western missionaries as pagan and hence rejected, although efforts to abolish it were unsuccessful (Ngong, 2011:8). Therefore the influence of the theological reflection of Western Christianity has continued to dichotomise humanity and nature in Africa.

4.3.4 Anthropocentrism in emerging theologies

The influence of technology and the anthropocentric nature of Christianity regarding humans' attitudes towards nature, as articulated by Lynn White (1967) and supported by many other scholars, are not only of the past. Emerging theologies refer to theological reflections that are taking place in most churches today. Most of the theological reflections today are still marginalising the natural environment in relation to human

beings. These emerging theologies are still portraying the anthropocentric nature of Christianity, hence suggesting a dichotomy between humankind and nature.

In this regard, McGowan (2010:88) has argued that even today, Christians have managed to do little to slow down the West's move towards environmental destruction. This means that apart from the theological influence on science and technology, and theological anthropology, there are emerging theologies that continue to disregard the destruction of nature by putting much emphasis on human affairs in this world and in the world to come, with hardly a mention of human responsibility towards creation, as if the entire doctrine of creation is about humankind (McGowan, 2010: 8). While there are many such theologies, the following are sufficient to serve as an example for the sake of this study.

The first of these insufficient theological reflections is the 'theology of prosperity.' This is currently a widely preached theology, focusing on the success of the individual in the social and economic order, rather than on shape of the order itself and its organic connection with the natural world. The SACC (2009:14-15) warns that there has always been a danger of the prosperity gospel being misused, especially when it is used to encourage 'upward mobility', i.e. a desire to accumulate wealth at any cost, including exploitation of the natural world in order to maximize personal gain.

Besides the theology of prosperity, there is the 'theology of the imminent end of the world.' This theology not only attaches a relatively low importance to present worldly life but also teaches Christians to take little care of the tormented earth (McGowan, 2010: 89). In the words of the SACC (2009:13), such a theology is also known as 'escapist theology'. This theology emphasises: spiritual affairs while downplaying the material world; concern for the soul rather than the body; heaven over earth; and the life to come rather than the present life. Similarly, Wirzba (2003:184) is of the opinion that in the modern times, people have found it difficult to "envision and confirm a meaningful creation-inclusive concept of salvation." On the basis of this theology, the Christian message of redemption is understood as salvation from the earth exclusively for human beings, and hence little concern for issues such as climate change and care for the natural world. In this theology, God is depicted as having little concern for creation, whilst

viewing the catastrophe caused by climate change and environmental degradation as a way of hastening the second coming of Jesus Christ to redeem the faithful.

The third theology which is based on the Creation story in Genesis 1:27, and in Romans 8, where human beings are portrayed as the “crown” of creation; it is called ‘mastery theology’ (SACC, 2009:12). In this theology, human beings are seen as possessing divine power and authority to use natural resources for self-gain and advancement. Admittedly, Wirzba (2003:123) concurred with SACC when insisting that among all the scriptural texts, Gen. 1:27-28 has played a significant role in shaping human understanding of his position in the created order. It has always been seen as if this text has a single meaning in all contexts. Although it is true that the meaning of dominion and subduing the earth is not given in the text, there has been only limited effort for the people of faith to learn from God their proper place in the universe. Even when the aspect of stewardship is put forward, it adds attribution and justification to God’s given mandate to humankind to freely use and abuse nature for his own sake. In so doing, Christian theology continues to create Christian characters that do not adhere to the sustainability of the natural environment.

This is why, argues Gnanakam (1999:51), the teachings of Christianity on the doctrine of creation, especially theology of dominion has been taken as the root cause of the current ecological disaster and climate change. In principle, when the term ‘dominion’ is used in relation to God’s rule it implies an overall responsible authority whereby humankind is only authorised to exercise responsible control of the earth resources on behalf of God. It is a distortion of the term ‘dominion’ that has sanctioned exploitation of nature. According to Gnanakam (1999:52) the term ‘dominion’ should be re-examined and understood as God’s delegated authority for responsible care of the earth. Therefore in the context of agriculture, “tilling and keeping” as well as “subdue and rule” alludes to humankind having been entrusted with a special responsibility for the earth that must operate within the framework of love, commonality, creativity, servant hood, stewardship and common good of all (Gnanakam, 1999:54-55).

4. 4 Tilling and keeping: A theological resource for sustainable agriculture

In the debate about global climate change, there is a considerable consensus that human activity is a major factor. Of these activities, agriculture is mentioned as one of the top contributors to the problem of climate change and environmental destruction, as reflected in chapter three of this study (Wibberley, 2008:2). On the other hand, Davis (2009b:260) mentions the Bible as a helpful resource towards the solution of this problem contending that the Bible writers, especially in the book of Genesis, were agrarian oriented and hence concerned with the sustainability of agriculture in relation to biodiversity. This entails that agriculture and climate change has a theological implication worthy of discussion in this section.

Given that agriculture is a dominant economic sector in most parts of the world, Tanzania included, and the second biggest contributor of GHG emissions (see chapter 3 of this study), it becomes clear that ecological integrity cannot be achieved without giving primary attention to life-affirming approaches to agriculture. Until a few decades ago, environmentalists, theologians, and other professionals have given scant attention to agricultural practices in their theological reflections. Since the Bible upholds that the health of humans and the health of the natural environment are indivisible, theological reflection on approaches to the world of agriculture becomes an imperative, especially currently, where unsustainable modern agricultural systems are known to have inflicted huge damage on natural systems and to have affected their functioning (Davis, 2009a: 261).

The phrase ‘tilling and keeping’ is a biblical metaphor which can be potentially used for the sustainable use of natural resources gifted by God for the earth’s life, especially regarding farming (Davis, 2009a:262). Steven Hall (2002:1-2) states that issues of sustainable agriculture have been an ongoing debate throughout the world since 1930s. The discussion on sustainable agriculture emerged after realising that modern agricultural methods are no longer sustainable, not only due to their high capital demand, but also due to the negative impact that they have caused to the natural environment. According to Hall (2002:3), sustainable life-affirming agriculture must constitute a triad of concerns: environment; economics; and the well-being of communities. Similarly, the King Report

III (IODSA, 2009:15) asserts that maximisation of profit as the bottom-line of any economic activity results in an unsustainable economy.

It must be noted that a sustainable economy or business, in this case agriculture, cannot be achieved unless planet, people, and profit are equally taken into serious consideration. In the same way, Scherr and McNeely (2008:1) infer that any sustainable economic activity must strive to achieve the joint objectives of maintaining biodiversity, ecosystems, and people's livelihoods. This means that farmers should also know that they are care takers of the natural environment upon which agricultural production depends. Therefore, environment, economics, and community are the critical components of sustainable agriculture. A farmer has the responsibility of maintaining the health and productive capacity of the environment, allowing for life-enhancing agriculture.

Reflecting on the first component of sustainable farming, i.e. the natural environment, Davis (2009b:261) attests that current approaches to agriculture demonstrate that the aspect of humans as care takers of the environment has declined. Humankind has considerably achieved dominion, i.e. the exercise of power over the natural environment but has failed to sustain its productivity. Maintaining environmental health throughout the farming process is based on God's judgement regarding the goodness of creation. This implies that the natural world has inherent value that can neither be obtained anywhere nor produced by any sophisticated machine or advanced technology. It is for this reason that God commanded humankind to till and keep the land/earth. Biblical texts such as Exodus 23:11 and Leviticus 25:4 speak of the land being given a period of time to rest and to recover its productive capacity. This was the kind of agriculture which was recommended in ancient Israel (Davis, 2009:262) and which is in line with the findings of current scientific research on sustainable agriculture. An example of these findings, as per the Millennium Ecological Assessment (MEA, 2005:5), is that the natural environment makes a great contribution to human well-being, especially when its integrity is safeguarded.

Succinctly elaborating on this further, Dianne Bergant and Dawn Northwehr (2009:187) equate 'tilling and keeping' to serving and safeguarding creation. They argue that prior to this command, the land seemed to be barren because God had not yet given its life-giving capacity by sending rain over it and because there was no humankind to cultivate

it. Although the Hebrew word is often translated as ‘till’ because of the agrarian character of the story, it has got another connotation, namely ‘service’ to the land/earth, implying human responsibility over nature.

In this regard, there is no subject-object relationship in the original setting of the biblical creation narratives, but harmonious co-existence between human beings and the rest of creation. The situation of climate change and environmental degradation experienced today, means that humankind is reminded and faced with the urgent task of re-fashioning the understanding of its relationship with the rest of creation. In a context where farming activities take the lead, like in Tanzania, it is important that farmers, within and outside Christian circles, learn to understand that they are not autonomous rulers and exploiters of the earth, but that as they farm the land, they represent God with a commission to care for His earth, as elaborated upon below:

God is the sole owner. Therefore, the only possible role of the people to the land is that of responsible stewards. The stewards cannot dispose of or use the land according to any whim, but must fulfil the owner’s instructions. There is no absolute right to property here. The ecological well-being of the land is intimately tied to the spiritual and material well-being of the people (Bergant and Northwehr, 2009:188).

This was the understanding of the Ancients. It is only by tilling responsibly that they could ensure their own well-being and the well-being of the entire created order. In their article “Metanoia and healing: Towards a great plains land ethic”, Duane Friesen and Bradley Guhr (2009:728) indicate that through fulfilling the divine commission to care for the land, human beings are actually caring for themselves since they are part of the cycle of life on earth. They further contend:

The earth is a community where nothing exists by itself, but always in relationship. We are not apart from the earth. Rather, we are the integral part of the earth community. This understanding rules out anthropocentric worldview with its devastating impacts on the planet earth, which has dominated our philosophy, economics and technology over the last several centuries. We are part of the wider community of cyclical process that sustains life (Friesen and Gur, 2009:729).

The second aspect embedded in the metaphor of the sustainability of agriculture, i.e. ‘tilling and keeping’, is economics. The term ‘economics’ originates from the Greek word

oikos, that speaks about laws and organisation of the planetary household of God, gifted to the earth community (Clifford, 2001:53). According to Hall (2002:3), economics is one of the key themes of the Bible, although it is largely either forgotten or ignored. This suggests that God's presence in all spheres of life is central to the theological discourse, although it is often not given enough attention in theological discussions.

Furthermore, Losos (2010:4) contends that when thinking of agriculture, the economic aspect suggests that the two words, i.e. economics and ecosystem, possess some similar characteristics. They both deal with the allocation of materials and energy between interacting entities in order to meet certain needs. This means that ecosystems supply material and energy inputs that economies need, while economies dispose of their waste back into the ecosystem.

Moreover, Blank (1992:11) differentiates between the abstract understanding of economics and the concrete understanding of it. Conventionally, the term 'economics' is described as a study of the allocation of scarce resources among competing entities. This is what Blank refers to as a technical and abstract perspective. On the other hand and from the theological perspective, resources are not scarce because God created the world ensuring enough resources for all to be able to sustain the entire web of life. Therefore, theologically, economics has to do with the management of the household, which is full of resources, while ensuring equal distribution of such resources for everyone in the community. It is specifically concerned with a particular aspect of the household, where the central purpose of management is to ensure that all members of the household have equal access to the resources that they need to attain quality life.

Since both words – 'ecosystem' and economics' - are derived from the same Greek root, *oikos*, it suggests that in order for the earth's household to survive and flourish, certain household rules need to be observed, i.e. a just-division of basic resources between all members of the family of life (McFague, 2001:72-73). In light of farming activities in the face of climate change, this means adopting an ecological-economic model of agriculture in order to ensure the sustainability of both agricultural production and the natural environment that supports it. This is opposed to modern approaches operating under the neo-classical economic mode, whose dominant values are the individual and growth (McFague, 2001: 81, 99).

The third aspect of sustainable agriculture as depicted in the biblical metaphor ‘tilling and keeping’, is the aspect of community, where respecting and caring for one another is so fundamental that no society can survive without it (Hall, 2002:4). This suggests that the ecological approach to agriculture is guided by the principle of sustainability and distributive justice to ensure the common good of all. Community, in this sense means the entire earth community, a home of all living beings that co-exist. Every farmer should be concerned with the well-being and sustainability of the entire household; planet earth. In her work *Super natural Christians: How we should love nature*, McFague (1997:152) comments that community should be regarded as an organic metaphor within which to understand human responsibility to the entire created order. Bearing this in mind, McFague (2001:100) asserts:

Ecological economy is a human enterprise that seeks to maximize the optimal functioning of the planet gift and service for all. Ecological economics is a vision of how human beings ought to live on a planet in the light of the perceived reality of where and how we live- we live in, with and from the earth.

From the agrarian perspective, the above sentiment urges farmers to perform agriculture in such a way that they do not harm the natural functioning of the planet. This will lead to a shared vision and a desirable society; one that is capable of providing sustainable prosperity within “biophysical constraints of the real world in a way that is fair and equitable to all of human and non-human living beings at the present and the future generation (McFague, 2001:123).

Following the same argument and arguing from the biblical understanding of the whole concept of sustainable community, Friesen and Gur (2009:734) contend that the biblical notion of covenant underlines the relationship between God, human being, and the earth community. The covenant requires adherence to both what are and what can be dynamically integrated layers of community within an ecosystem that sustains the web of life. They further add:

An earth-friendly economics is integral to restorative justice, human beings appropriately manage their environment through good work, work that sustains their own lives and communities...As reflected in Genesis 2, farmers are called to care for, to serve, and to be keepers of the garden [earth]. Human beings are

called to see the earth, our home, as God's home, where God is pleased to dwell. That the earth is our home and is God's home stands in sharp contrast to the old song we use to sing, 'this world is not my home, I am just a passing through' (Friesen and Gur, 2009:735).

Therefore, humans are called to change their anthropocentric attitude towards the earth and to respect the earth as God's household, whose members include those beyond humankind. This means that farming approaches that threaten the life of all species must be interrogated in order to ensure that all forms of life are maintained for both present and future generations.

The tilling and keeping metaphor as agro-theological resource has the potential to forge a shift towards a life-giving agriculture, both at a small and a large scale. Recognising the urgent need for such a shift, the Global Forum Report – (GFR 2005:1) on life-giving agriculture states:

In the face of life-killing agricultural policies and practices of neo-liberal economic globalisation, this forum provides a platform where farmers, particularly Christian farmers....could share their thoughts and methodologies of life-giving Agriculture (LGA) and identify strategies for globalising their ideas; to deepen and amplify their faith and theological reflections on LGA forms of farming practices pursuing a theological reflection from an agricultural perspective; to awaken the Christian communities and Churches to give more attention to this issue and to bear faithful witness for the sake of life-giving agriculture.

As noted in this sentiment, the LGA initiative is an attempt to oppose the popular claim of economic globalisation - 'there is no alternative' (TINA), by encouraging human society to put "life in its fullness" at the centre of every economic activity, including agriculture. Given the huge impact that climate change has on agriculture and on all forms of life in general, LGA becomes a philosophy for re-affirming the basis of life in all its fullness. It also becomes a driving force and a practice for fundamental change from an anthropocentric to a non-anthropocentric attitude towards nature.

Theologically, this will allow for transformation of the current life-threatening agricultural methods into ones that are life affirming, nurturing, and sustaining. Life-fostering has been the central focus of agricultural activities in almost all societies, without mentioning millennia of feudal and oppressive social structures (GFR, 2005:2).

In line with the idea of the centrality of life, Rasmussen (1995:112) attests that even from a theological-ethical perspective, the Hebrew Bible gives life the central role, based on the character and presence of God, who is considered to be the Author and the Power of life. Such sacred power was the moral force to reject any inevitability of oppression, injustice, and exploitation, while permeating and making possible the transformation of the entire global community.

Concurring with Rasmussen, Davis (2009b:106) reiterates that the notion of LGA is in line with the biblical emphasis on the importance of the 'local economy' which is promoted by the whole idea of equal distribution of land among Israelites. In the biblical perspective, it is local economy- where local communities possess land and produce food- and not multi-corporation economy, which is sustainable and life-affirming. The sustainable and life-affirming agriculture, in this sense, finds its basis in the fact that that equal distribution of land and local production of food are always coupled with kind use of land or discipline of caring for land in its particularity, as stated: "Kindly use of land is the economic discipline observed by people who expect their 'seed' to be thriving on the same farm for generations to come" (Davis, 2009a:108). On this basis, it is obvious that land care has to be part of the covenanted life within the entire web of life behind which stands God's creative power.

Embedded in the Hebrew conviction of the sacred power of God [life] was a strong ethical component of human responsibility over the conditions of the world, and co-participation with God in creation and transformation is the human vocation (Rasmussen, 1995:113). This biblical conviction of the sacred power of God [life] manifested in the created order, argues Sowunmi (1995:152), can also be echoed in the belief of most of the indigenous people around the world. For example, most indigenous people consider land as a mother, in the sense that land is a "source of nourishment, survival, and indeed life" and therefore must be treated with respect, care, and honour. Reflecting on African and Asian ecological feminist spirituality, Kyung (1995:178) gives an illustration of how a natural tree captures life-giving thrust and power, as viewed from the ecofeminist perspective:

... its roots go deep into the soil of mother earth, strengthening it against erosion yet sucking its life-giving moisture. Its trunk thrusts upward into the freedom of the sky.. The leaves transform death-dealing, poisonous carbon dioxide into life-

giving oxygen. They provide shelter and shade for the life and growth of diverse insects, plants, birds, animals and humans. Its fruits give food for the body and its flower gives food for the soul. Then, its leaves die and become compost to re-create soil. This cyclical, rhythmic process of creating, nurturing, healing and re-creating life symbolises the aspirations of the cosmic spirituality of eco-feminism.

This is exactly what happens in the process of farming and any sustainable treatment of creation, where nature is allowed to sustainably offer its diverse services that God made for life-enrichment and nourishment. It is on this basis that most farming families practice farming with the awareness that while they are responsible for planting and watering, it is God who gives the rain, the sunshine, and the produce, and who controls the growth and reproduction process of the plants. In this way agriculture becomes not only linked with their spirituality but is also a life-fostering instrument.

The GFR (2005:2) explains how agriculture has diverged from its original role of life-fostering to life-threatening, as it asserts:

Today agriculture in many places has become a massive economic activity, torturing nature, human and other species to produce more and more for human greed rather than for legitimate needs. This has happened because agriculture has been forced to operate under the present dominant development model of agriculture based on the corporate and free market, characterised by capital intensive, export-oriented, monoculture with profit as its central motif.

As a result of this, farmers have limited choice and are bound to adopt modern farming methods and to “use Genetically Modified Organism (GMO) seeds, pesticides, chemical fertilizers etc” (GFR, 2005:5), the consequence of which is the degradation of soil, the loss of indigenous seeds and skills, and the loss of biodiversity, among other ills. While the claim stated in the sentiment above can be a subject for further discussion and although it is beyond the limit of this study to engage a detailed discussion for that matter, it goes without dispute that the original role of agriculture to sustain life in all its forms needs to be reclaimed. It is on the basis of this reality that Jenkins (2008:17) advocates for more life-affirming methods in the world of agriculture because, *inter alia*, changes in agriculture and land use disturbs the natural functioning of the earth system. From the theological perspective, with the context of climate change in mind, this raises a critical question regarding ways in which the world of agriculture “might conform to

the patterns of God's way" (Jenkins, 2008:156). This is what life-giving agriculture is all about.

Affirming the feasibility of the project of life-giving agriculture in the context of climate change and environmental degradation, LenkaBula (2009:119-125) has described such agriculture as being counter to the toxic elements resulting from the dominant mode of farming, and seeking to sustain both humanity and the entire creation. She continues, proposing tenets of life-giving agriculture to include but not limited to, the following:

1. That such agriculture must adopt practices that are attentive to the oikos - the household of God. This means that LGA should affirm both the beauty of life and God's creation (LenkaBula, 2009:125), and that human beings should know that they are a created species with a responsibility to care for and bless the rest of creation (Brandt, 2001b:1);
2. LGA should seek to promote harmonious living among those whose lives are sustained by natural resources, remembering that human dominion is properly and scripturally exercised as a caring and sustaining support for the whole creation;
3. LGA should be driven by the philosophy of life in fullness away from excessive competition, greed, and selfishness (LenkaBula, 2009:119). According to Northcott (2001:32), such a philosophy stimulates an attempt to recover a more holistic concept of life on earth in which human life and society are re-connected with the biophysical character and limits of ecological systems;
4. LGA should engender spirituality in people, or a faith and ethics of sustenance as a necessary component of their lives and their interaction with creation as a whole (LenkaBula, 2009:120). Elaborating further on this, Clifford (2001:53) points out that given that current studies indicate that to a large extent, issues of caring for creation are almost new to the Church, Christians' spirituality and faith can be strengthened if the Church engages with these issues;
5. LGA should adhere to social equity and ecological technologies instead of agrochemical concentration;
6. LGA should encourage diversity over monoculture;
7. LGA should not threaten the well-being of creation and people (LenkaBula, 2009:120).

In light of this study, that seeks to explore how an African Christian ethic of care can be cultivated to enhance sustainable agriculture, these tenets seem to adhere to the biblical or divine commission of tilling and keeping the earth in order to sustain life, which is threatened by adverse challenges of climate change, among other life-threatening forces. This marks a shift from life-denying systems of farming [irresponsible modern agriculture] centred around anthropocentrism “into ethics and theologies of care, justice, solidarity, cooperation, community, the integrity of creation, wholeness and well-being, the fullness of life for all, and the reign of God, as the principal elements of life-sustaining and life-affirming systems in our world today (LenkaBula, 2009:127).”

Apart from metaphors of tilling and keeping the earth, there are other two theological metaphors behind life-giving agriculture: *oikos* and *oikonomia*. Theologically, both are used to refer to planet earth as the household of God, where all living creatures live together interdependently and in harmony (LenkaBula, 2009:137). This, then, becomes the basis of life-giving agriculture in the context where the powers of climate change and environmental degradation have become life-denying for the majority of people. With an understanding of the earth as *oikos* and *oikonomia*, the human community can become cognisant of its dependence on the wider earth community, and on the value of ecosystems as the foundation of all life and all human activities. In this regard, “economic value is measured by the way an activity [agriculture] contributes to healthy relationships and to the sustenance of life, not the amount of monetary profit it generates” (Hathaway and Boff, 2010:59).

4.5 Chapter summary

Chapter four was set out to exhibit how theology is both a problem to, and part of the solution to issue of climate change and ecological crisis. It has demonstrated how theological discourse has and continues to be a problem to the current ecological crisis and climate change which extends its impact to the world of agriculture. The chapter has also demonstrated how responsible theological reflections can contribute to the solution of climate change and environmental problems today. In the first place, it has been argued that environmental problems and climate change are both theological concerns. Throughout history, whether consciously or unconsciously, theological reflections have

fostered unsustainable human attitudes towards the created order by encouraging and uncritically supporting the development of the irresponsible use of science and technology. This has occurred through developing biased anthropocentric Christian theologies on the basis of which some more emerging theologies have occurred that have a similar effect. Coupled with this is the missionary approach to God's mission that downplayed indigenous knowledge regarding the role of the created order in sustaining life on earth. Taken together, this has influenced the formation of a human character that developed unsustainable economic systems upon which agriculture operated and still operates to the larger extent. The chapter went on to suggest the biblical metaphor of tilling and keeping as an agro-theological response for creating more sustainable approaches to agriculture in the context of climate change and environmental destruction. However, in order to transform the current unsustainable agricultural methods that are life-taking into more life-giving approaches, based on the biblical metaphor of tilling and keeping, as well as *oikonomia*, a moral vision engraved in sustainable agriculture has to be imperatively re-defined. Chapter five of this study is dedicated to this task.

CHAPTER FIVE

AFRICAN CHRISTIAN AGRO-MORAL-THEOLOGICAL VISION IN THE CONTEXT OF CLIMATE CHANGE

[Land ethic] highlights the necessary changes in self- and world-understanding that must take place if we are to be honest with ourselves and others. It also establishes the basic ethos that must guide our action if we are to live long and healthy lives (Wirzba 2003)

5.1 Introduction

Chapter four was set out to exhibit how theology is both a problem of, and part of the solution to climate change in relation to the world of Agriculture. This was done by describing the link between theology and the world of agriculture as well as climate change. Such description was followed by articulating the influence that theological discourse has had on peoples' views of both the created order and unsustainable agriculture which has contributed to the problem of climate change today. It was further argued that apart from theology being a problem, it can also be a potential resource in curbing challenges of climate change and promoting life-enhancing agriculture. Using the second and the third principles of ecological transformation, i.e. deepening ecological knowledge and renewing the human psyche and the theory of responsibility, chapter five makes an attempt to provide some insights regarding African Christian agro-moral vision as a theological response to issues of climate change and life-enhancing agriculture.

Therefore, the first section of this chapter pays attention to discernment of the moral-theological implication of climate change in relation to the world of agriculture. The second section offers a brief highlight on the nature of the existing moral frameworks and their inadequacy in responding to issues of climate change and unsustainable agriculture. In the third section the chapter makes an attempt to re-envision Christian ethic that enhances moral responsibility in curbing challenges of climate change, while promoting sustainable agriculture. Fourthly, the chapter continues to advocate the need to reclaim divine vocation of caring for the earth through sustainable agricultural methods.

5. 2 Discerning moral-theological implications of climate change

Reflecting intensively on the whole issue of climate change, Garvey (2008:33) is of the opinion that although scientific facts regarding climate change are of critical importance in our understanding of and response to climate change, they do not tell the whole story. It is supremely important to have an understanding of the role that morals play in human decisions, actions and behaviours (Garvey, 2008:36). According to Arnold (2011:1) the complexity of intergenerational moral concern posed by climate change has currently attracted a significant body of scholarship in various disciplines, including theological discourse. This is the case because it is widely perceived that climate change is the outcome of the unsustainable human attitudes towards the rest of creation. Similarly, Jamieson (2011:31) contends that climate change raises a moral question because of its capacity to severely harm people in various ways. On the basis of this orientation it has been argued:

Addressing challenges of climate change requires not only strong political leadership, but also more profound ethical or moral reflections and debates are needed to win over not only the minds but also hearts of citizens and to make change effective (COMECE, 2011:13).

This is true because it is widely acknowledged that ecological problems which add up to climate change raise the question about the ethical life of human beings as well as the mission of the church. In other words, ecological crisis that results in climate variability is concerned with public ethos - something which is hard to change without critiquing certain ways of organising society, and also without questioning the ways in which people live together and the value systems of society at large. The fact that industrial agriculture and anthropocentric theological reflection, as discussed in chapter three and four of this study, have nurtured a human behaviour which is detrimental to God's created order, suggests the loss of both a divine cosmovision and the divine vocation for tilling and keeping the earth. Hathaway and Boff (2010:130) attest to this, saying:

The culture of modernity that originated in Europe may well be the first human culture to have lost a functional cosmology. This process began nearly four hundred years ago with the Enlightenment and the scientific revolution initiated by thinkers such as Copernicus, Galileo, Descartes and Newton... As education in modern science became more and more widespread, however, many people unconsciously adopted a split between their scientific and religious beliefs... As the secularism grew, the idea of a purposeless, infinite universe deepened its roots

in more and more people - including many of those with the greatest power to shape the dominant political, economic and ideological forces in our world.

The above assertion brings to the fore the connection between theology, ethics, cosmivision, and praxis that must undergird an understanding of the moral-theological implications of climate change, with a special focus on the agricultural sector. This is crucial because agriculture, as currently practiced, constitutes the largest threat to biodiversity and to ecosystem function, and is the second highest contributor to climate change today (Davis, 2009b:1). Moreover, Garvey (2010: 96) argues that the aspect of moral concern regarding climate change has not been given enough attention in the climate change discourse. The reason for this is that the dominant technical language of science and economics commonly conceals the critical ethical questions brought about by climate change. On the contrary, Yanda and Mubaya (2011: 20) argue that, “according to the pace and trend of climate change, the available literature recognises that climate change and variability, extreme events and structural changes have had a major moral impact on economic, social and human living conditions as well as on natural systems.”

There are a number of moral concerns that are being brought about by climate change. In the first place there is the issue of atmospheric stabilisation. This is seen as a matter of life and death due to the fact that the level of warming that occurs will, in the long run, determine which species on earth survive (Garvey, 2010:96). In this regard, Yanda and Mubaya (2011: vii, 4, 19) submit:

...the realisation of the earth’s climate might be sensitive to the atmospheric concentration of gases that create effect is more than a century old. Surprisingly, it is now more evident that climate change and variability bring significant negative impacts to countries that have historically contributed the least to greenhouse gas emissions, land-use and have least capacity to adopt.

Secondly, there is an unequal question with regards to the allocation of emissions among nations, since some nations emit more than others (Garvey, 2010:97). Reflecting further on this aspect, Yanda and Mubaya (2011:4) assert:

...data for per capita emissions of carbon dioxide, excluding land-use change, indicates that in most African countries emissions are less than 0.5 tonnes per capita. This is equivalent to one-twentieth that of the United Kingdom. Surprisingly, Sub-Saharan Africa, with eleven percent of the world’s population accounts for just 3.6 percent of the world’s emission of Carbon dioxide.

Thirdly, the payment for damages caused by climate change is also questionable, given that those who are the most affected contribute the least to emissions. Fourth, there is an enormous potential adverse impact on human and environmental health that cannot be comprehensively predicted. Fifth, there is an anticipated disproportionate effect on poor countries, which have a lower contribution to changing climatic conditions (Garvey, 2010:98). It is argued that in most developing countries, efforts to eradicate poverty are seemingly challenged by the fact that climatic changes have “long-term trends and other repercussions on food security, water supply, sanitation, education and health care”, all of which require deliberate and immediate attention (Yanda and Mubaya, 2011:21).

Sixth, climatic changes have turned out to be a threat to human dignity, which is embedded in the notion of *imago Dei*. Human dignity, in this regard, is an unconditional value which precludes all types of oppression and exploitation - which are the end result of climate change. Caritas (nd: 13) is in line with this argument when saying:

our treatment of natural world diminishes our own dignity and sacredness, not only because we are destroying resources that future generations of humans will need, but also because we are engaging in actions that contradicts what it means to be human. Our tradition calls us to protect life and dignity of the human person and it is increasingly clear that this task cannot be separated from the care of all Creation.

Seventh, climate change threatens the sustainability of life on earth for both current and future generations. Unless there is adequate protection of God’s created order in both the medium and long terms, there will be no human dignity possible on earth. Issues of sustainability have to do with responsibility towards creation. This is fundamental for global and intergenerational justice for it means that in using natural resources, especially in the world of agriculture, humanity has a particular responsibility to the entire earth community (Caritas, nd:15). In his article “A question for our own survival”, the Dalai Lama (2010:15) affirms this:

Peace and survival of life on earth as we know it are threatened by human activities that lack a commitment to humanitarian values. This lack of respect extends even to the earth’s human descendants, the future generation who will inherit a vastly degraded planet if world peace does not become a reality and if destruction of natural environment continues in the present rate...It is essential

that we re-examine ethically what we have inherited, what we are responsible for and what we will pass on to the coming generations.

In line with the Dalai Lama, Ebtekar (2010:178), reflecting further on the whole question of the sustainability of life on earth in parallel with advancement of science and technology, argues:

The world today is not what we had hoped it would be. It does not embody what science and technology could have brought for the betterment of all. Although a few millions are better off, the majority of human population still suffer from poverty, diseases and environmental degradation is on the raise. Prospects of the future are overshadowed by dark realities.

In light of the above assertion, the National Climate Campaign (NCC, 2011:2) - points out that climate change calls for the moral obligation to prevent suffering and to protect life. Climate change presents a moment to say no to any course of human suffering. This is because climate change produces impacts that are already harming and life-taking across the world.

Eighth, the context of climate change appeals for moral responsibility to honour the principles of justice and equity. This would allow for the prevention of the suffering and deaths of people and other created beings that have made little contribution to climate change (NCC, 2011:3). Commenting on “Life worth living”, Jamieson (2010:185) is of the opinion that knowledge of these injustices may not be enough to help people change their behaviour. The important thing is for people to begin to understand the need to forge a “vision of a meaningful life that involves seeing ourselves as part of an intergenerational community” (2010:185).

Ninth, climate change raises a moral obligation to protect and honour the processes that make life on earth possible. This is largely due to the fact that earth’s gift or God’s creation has intrinsic value critical for sustaining all forms of life on earth. Therefore, protecting the ecosystems and organisms that provide the air, food, water, and materials used to sustain life, as well as the natural beauty that uplifts and prospers the spirit, is a moral concern for all (NCC, 2011:3). Emphasising this further, Nasr (2010:254) has this to say:

As we contemplate our responsibility for future, we must first of all recall that we cannot think and act in the present only, because we have been endowed with a

consciousness and memory that enables us to be aware of the past and to some extent anticipate and foresee the future on the basis of our knowledge of the past and our thoughts and actions in the present.

In the light of this sentiment, it is clear that human beings are by nature responsible for the “ecological health of the planet and of their own heritage to be bequeathed to their family and community” (Nasr, 2010:156). Given the seriousness of the impact of climate change in almost all aspects of life, especially in the agricultural sector, Nasr (2010:258) continues:

Since our intelligence has the power of anticipation, we can in a sense hear anew the cry of the future, beckoning us to heed its call and fulfil our responsibilities toward it. And it is this call to which we should be attentive; this call more than anything else should determine the responsibilities we bear in our thoughts and acts at the present moment and toward our heritage from the past that we must interpret in light of our responsibilities to the future.

Tenth, climate change affects and threatens the common good of all and the earth community’s solidarity (Caritas, nd: 13). Advancing this argument more concretely, Safina (2010:325) contends that throughout world history almost all “just causes have been a struggle between the good of many and the greed of the few.” Moments of climate change indicate that human beings have stopped viewing their relationship with the entire world as of critical importance for the sustainability of life on earth. As a result of this attitude, the common good is compromised. The earth is the common home for all and everything that is within it is part of this common home (Heinrich, 2010:334).

All that has been discussed above, while not exhaustive, is sufficient for the sake of this study and constitutes the ethical or moral aspects that have been brought to the surface by the phenomenon of climate change, which in turn affect the world of agriculture. In the article “The ethical implication of the global climate change”, UNESCO (2010:7) summarises these ethical concerns into two major categories: the first includes impacts of climate change that threaten the well-being of the earth community in general; whereas the second involves issues that have to do with justice. The issues of threat to all living beings, to the health of people and of the entire creation, to wealth, to property and livelihoods, to ecosystems, to economic stability, of mass emigration, and to human dignity, together locate life at a very risky moment, thus affecting the well-being of the whole earth community. On the other hand, issues of justice include distributive justice, compensatory justice, procedural justice and human rights (UNESCO, 2010:14). This is the case because, contends Prozesky (2005:17):

Human beings interact directly with the world of nature- the soil, the streams and rivers, the plant cover, the insects and animals. Scientific knowledge and agricultural practices are forms of power - a highly potent form - and power can be used for good as well as evil. It needs ethics to give good the edge over the evil.”

On this basis, it is clear therefore that climate change presents a major threat to the well-being of the entire community of life on earth, and thus calls for an ethical response. Based on all these realities and of many more, one may well ask some of the critical questions such as: in the context of climate change exacerbated by, inter alia, modern farming practices, which human behaviours are right or wrong?; which are fair and unfair?; what are the duties and obligations to the rest of created order? (NCC, 2011:1). It is not within the limit of this study to respond to these ethical questions in greater detail, unpacking three aspects of moral systems, namely moral vision (getting moral ideology right from the start), virtues (embodiment of good virtues) and practice (doing things right). However, it suffices for the sake of this study, though, to offer some highlights on the aspect of moral vision, because having a vision right leads to the easier embodiment of virtues and also life affirming practice.

Due to the magnitude of the problem of climate change, the ethical questions raised above suggest the adoption of holistic moral and ethical principles that are capable of guiding the human moral response to the current climate crisis, especially through the adoption of life enhancing farming practices. It is the holistic moral and ethical principles that will determine who the real humankind are, either as individuals or as nations and, through treating God’s creation ethically, will influence the way that they treat each other and understand human dependence on the rest of creation as French (2005: 469) states: “...the global ecosystem is a vast superpower upon whose outpouring of energy all human communities, national economies, and living species depend.” The importance of such ethics is well emphasised by Prozesky (2005:13), as he says regarding what is needed when it comes to issues of agriculture:

[We must] foster a deeper appreciation of the importance of ethics for successful and sustainable agriculture, for if we cannot husband the earth in ways that are just, participatory and sustainable, we won’t husband anything else on the planet... except the graveyard of our own folly.

This calls for a critical reflection on Christian ethics in general, and for the articulation of some key aspects of African Christian ethics in particular that can potentially provide an agro-moral vision for curbing the adverse impact of climate change and promoting life-enhancing agriculture.

5.3 The nature of existing Christian ethics

Ethics, from the word *ethica*, is generally used to refer to customs and conducts that a particular culture or community has agreed upon. Traditionally, ethics is known as moral philosophy, which deals with human values and moral principles in a systematic way, hence guiding people's choices in various contexts (Gnanakam, 1999:166). Apart from the fact that the Bible is concerned about life and how it should be lived every day, e.g. covenant life, ethics has been given narrow space within the wider scope of theological discourses. With the current contextual approach to theology, it has been clear that theological implications are spreading to touch almost all areas of life. Looking at the environmental issues that exacerbate climate change in relation to agriculture, it is well noted that the key causes are largely ethical, and hence need critical moral attention (Gnanakam, 1999:167). While such critical attention is important, it has to begin with articulating the nature of existing Christian ethics in general.

Jones (2005:16) argues that when someone speaks of Christian ethics, it becomes clear that the source of such ethics is religious. Such a source might include the church as both an institution and a community of believers. Ethics can also involve the history and traditions of a particular denomination. However for Christian ethics, the centre of all discussion on ethical issues is the Bible. It is therefore expected that the Bible is to be recognised as the basic authority and source from which Christian faith communities draw for justification of their ethical decisions. This is true because it is believed that human beings [Christians] are gifted with the ability for moral judgment that is "distinct from other religious beliefs" (Penelhum, 2000:10). Kretzschmar (2009:16) contends that almost every society tends to construct a particular way of living which is perceived as morally acceptable and which enriches the common good of all. Equally, Kunhiyop (2008:3) points out that every society is influenced by its history, beliefs and values.

Morality is a term used to explain “commonly accepted behaviour within the society” in which norms and values are embedded. On one hand norms constitute instructions and principles to guide people within the community on how to live a “moral life.” On the other hand, values constitute elements of what humans desire to achieve for self gain or for others. It is these values that guide people’s decisions, attitudes and behaviours. In this regard, ethics becomes a “critical reflection on moral norms, values and behaviour of individuals and societies in order to assess the validity of their actions.” Broadly understood, Kretzschmar (2009:17) argues:

Morality and ethics are central to personal, family, social and environmental well-being. They seek to ask why things are the way they are, how life ought to be lived and how ‘what is’ can be transformed into ‘what ought to be.’ The two works together to provide orientation to life for individuals serving as a map that helps people to find their way in life. They also serve as fabric of the society providing the structure and glue that keeps the society healthy and functional... holding things together. They are finally indispensable for the future of life helping people to make difficult decisions now in order that life will be improved in the future.

Ethics is said to be of three categories: normative ethics; descriptive ethics; and meta-ethics. While normative ethics is prescriptive in nature, seeking to prescribe moral direction and expressing a view of what is right or wrong, descriptive ethics offers statements or accounts of how people should behave without indicating either agreement or disagreement with the described behaviour. Meta-ethics focuses on religious languages and the logical or rational basis for ethical systems (Kretzschmar, 2009:16).

In concurrence with Kretzschmar, Kunhiyop (2008:30), basing the argument on African cosmology, affirms that ethics and morality are related. They are both used to define principles governing the appropriate conduct of an individual or a group of people within the wider society. While ethics relates to the theoretical study of right and wrong, bad and good, morality is concerned with actual behaviour - the living out of what one believes to be right and good (Kunhiyop, 2008:4). For Kunhiyop, this compartmentalization of ethics is not African.

In the African context life is not compartmentalized between theory and actual behaviour, rather it is understood in its holistic sense. This shows that to a large extent, existing Christian ethics is influenced by the Western understanding of ethics, which is rooted in Western philosophy. This is because Western philosophy has had a great

impact on modern Western Christian ethics (Kunhiyop, 2008:5). It means that the existing Christian ethics operates within the framework of Western philosophy and Western ethics, where ethical questions are framed in a way that reflect the Western interpretation of biblical values (Kunhiyop, 2008:27).

In other words, although Christian ethics can be understood as an ethics that emphasizes moral life from within the life of the Christian faith (Stumme, 1998:1), elements from Greco-Judeo Christian traditions have had an enormous influence on Western Christian thinking about ethics and have been the critical forces at play until the 18th century (Kunhiyop, 2008:27). Moreover, argues Lovin (2005:19), Greek tradition offered a systematic account of virtues that were highly respected, whereas in Hebrew tradition some principles of justice and mercy were established to explain the requirement of the law (Torah) in order to create an equal and sustainable society all of which has a significant influence in moral reasoning and ethical decisions.

Apart from the Greco-Judeo Christian influence, the Enlightenment movement (Kunhiyop, 2008:28-29) and technological development (McKenny, 2005:449-450; Moltmann, 1999: 96) have had a decisive influence on Western ethical orientation which later was expanded to other parts of the world, including African and Tanzania in particular, through various means. Consistently indicating how Christianity was influenced by all these historical and technological developments, Birks (2009:53-54) points out that as these advancement took place, theology (Christianity) has hardly claimed to be the “instrument for physical recovery.” By doing so, Christianity, as moral stimulus entity, has uncritically enlarged the domination of science with its merciless plundering of God’s creation. A true theology should have taught that the entire God’s work is full of His wisdom, worthy to be remembered, cared for, protected, and honoured, thus stimulating human moral responsibility towards the natural environment (Messer, 2008:99). This calls for a re-envisioning of Christian ethics that can potentially inform human responsibility and the moral obligation towards God’s created order, especially in these times of climate change and unsustainable agricultural methods.

5.4 Re-envisioning Christian ethics to enhance agro-moral vision

As alluded to in the above discussion, climate change, especially in the world of agriculture, raises some fundamental ethical questions that require an agro-moral vision response. The framework, in which the current Christian ethics operates, especially in the African context, is insufficient since it is individualistic in nature for it is Western oriented. Biblical ethics for tilling and keeping the earth as commanded by God the Creator have long been marginalised in moral-theological discourse and to some extent in the mission of the Church (see chapter seven).

Therefore, the current crisis calls for re-envisioning African Christian ethics which can potentially cultivate human responsibility for God's creation and be integrated in the day-to-day life of people, especially in the agricultural sector. In order for such re-envisioning to be realised there are three critical steps, though not exhaustive, that need to be followed, namely: redeeming the divine vocation of caring for the earth, re-interpreting eco-dominion and reclaiming an African cosmivision, each of which is discussed below.

5.4 .1 Redeeming the divine vocation of caring for the earth

In the light of the discussion held in chapter three, the impact of unsustainable agriculture on soil [earth] cannot be overemphasized. However, apart from the agriculture's harmful impact on the quality of natural environment, Thompson (1995: 2) construes that "farming remains a prime source of metaphors for correct relationship between humans and the wider natural world." This suggests that unless farmers develop a right and proper relationship with the land and transform their farming practices, efforts to combat challenges of climate change will continue to be fruitless. This is because "farming that abuses soil is bad farming" and it is not "consistent with the true spirit of farming itself" as instituted by God (Thompson, 1995:3). Therefore, the seriousness of the adverse effects of climate change, especially in the agricultural world suggests that human beings have diverged from their original call and responsibility to keep the land [earth]. Webber (2011:2) argues that in order to reverse this situation, the nature of public moral reasoning itself needs to be transformed, as he contends:

...while it is not easy to alter the moral reasoning that has dominated us for many years, it is critical that our existing value systems need to be changed fundamentally in order to accommodate the intrinsic value of nature. The current public moral reasoning encourages the belief that concern for the environment is simply a specialist interest or minority pursuit.

This reveals the need for turning back to the divine and original vocation as a starting point towards cultivating human responsibility towards God's creation, based on the fact that God is the sole Governor and Sustainer of life through His creation, as Osmer (2008:146) observes:

World is commonly portrayed as God's providential care of all. God orders and preserves creation through both impersonal and personal relations while respecting creation's contingent freedom. The fitting human response is to care for ordering process and structures that sustain life, working to align them with God's purpose. This call for moral discernment of God's will within the particular event of life and the broader process of continuing creation.

In light of this sentiment, and bearing in mind the context of climate change, farmers are called to go back to farming God's way, i.e. putting life at the centre of farming practices and thus promoting life-affirming agriculture. In this way, farmers will be able to alleviate health problems and environmental pollution while strengthening the earth community (Woods, 2008:1). Given that current dominant farming practices do not reflect biblical stewardship principles, but rather exploitation, farming God's way ensures that agriculture serves as a link between faith and work. This is contrary to the notion of agricultural abundance, which irresponsibly emphasises the use of many chemicals in the soil resulting in damaging its capacity to support, enhance and sustain life on earth (Zimdahl, 2002:45 and Sawunmi, 1995:25).

Advancing the same argument further, Malsbury (2011:3) consistently infers that in order to be able to respond to some of the life-threatening issues such as climate change and the popular unsustainable agriculture, a deliberate effort must be taken starting at the beginning of the entire created order. This can potentially remind people of their link to the land and to be grateful for the food they eat, as well to the earth on which the food is produced (Churches' Centre for Land and People, 2011:2). Moreover, this has the potential of helping people to become a powerful force for making the connection between food, faith and agriculture. Christian faith communities have an added incentive to farming God's way in the context of life-threatening climate change. Einthewoods

(2008:2) has argued that the importance of Christians supporting sustainable agriculture is based on the three major biblical realities.

In the first place, the presence of diverse dietary and agricultural laws in the Bible is evidence that God is concerned with the ways that agriculture is practiced and food produced that negatively affect the natural functioning of the earth systems. The second point to be made is that agriculture should demonstrate cleavage between faith and work, contrary to the current exploitative industrial agriculture which does not reflect stewardship principles (2008:2). Furthermore, According to Zimdahl (2002:46), agriculture is meant to sustain life, based on the fact that it produces food. Similarly, food is critical for life and it comes from the land, not from money which many people emphasise. The fact that food is produced from the land (creation), suggests that land (creation) is the essential element in the production process that need to be honoured, respected and protected.

While this is true, the current fundamental values of the food production system do not pay attention to the protection of land as a critical part of the community of life, and hence the command to till and keep the earth has been violated. In the context of climate change that threatens agricultural production and life in general, proper farming practices need to be centred around two main goals: social and environmental. On one hand, profitable, sustainable and environmentally safe production, as well as livelihoods, and a just social order are the key components of the social goal of agriculture.

On the other hand, the environmental goal of agriculture implies that in agriculture, sustainability has to do with protecting the productive resource base, i.e. soil quality, and maintaining production. This means that due to the fact that agriculture is the largest and most widespread human interaction with the natural environment, achieving its sustainability has a social and ecological effect (Zimdahl, 2002:47). Therefore, farming God's way forms a foundation for moral-ecological ethics that helps to create the values, attitudes and perspectives necessary for creating environmental, social and economic sustainability, thus contributing to a healthy planet, both now and for the future generations (Greenhert Education, 2013:3-4). It is in this way that tilling and keeping the earth implies farming God's way.

Given that the bottom-line of current agricultural practices is to obtain wealth without concern for God's creation which forms the basis for production, Zimdahl (2002:50) and Callicott (2012: 2) attest that in order for farming God's way to work, an adoption of a revolutionary ecological worldview into policy and farming practices is of paramount importance. This will allow farmers to view the components of the natural environment as integrally related to all forms of life. Such a worldview, adds Davis (2009a:1), can also be termed an agrarian view, which entails a "way of thinking and ordering life in community that is based on the health of the land and of living creatures" and which currently has been marginalised by the powers of neoliberal economic policies which prioritize wealth accumulation at the expense of the natural environment. It is about changing the mindset of those who are involved in farming in one way or another. Moreover, changing the mindset of agricultural practitioners in the light of climate change is necessary because the agricultural sector is different from all other economic sectors or industries. Affirming this fact, Coley (2011:36) says:

Agriculture is, by virtue of its work and relationship to the society of which it is part, a provider of a necessary social good. Therefore, it is inherently different from other industries, especially from the more mechanistic ones that it attempts to emulate. Any provider of necessary social good e.g. health care, education, scientific research etc, are held to much higher ethical standards because of the intimacy of their relationship to the society. The ethical standards [in these sectors] are generally seen as being necessary even in the face of higher economic cost and financial burdens it requires to enforce. Agriculture not only produces necessary social goods but behind their production they also rely implicitly on living beings.

In this regard and looking closely at current agricultural practices, agriculture does not fulfil this obligation, nor is it regulated in ways that ensure this responsibility is met. Therefore, adopting tilling and keeping as a model of farming God's way provides an opportunity for the agricultural sector to continue to play its important role in society and to increase the human ability to create a better world for all.

Respecting creation and ensuring a continued flourishing of God's Created order is of significant importance because, says Coley (2011:106), "it is undeniable truth that human beings are the only creatures on earth who generally cannot feed themselves" in the sense that if ecosystems do not properly support agricultural production there will be no food; hence no life is possible. In this regard, it is the created order that is feeding human society through agricultural production. This suggests that in the face of climate change,

moral values and ethical obligations cannot be reduced to mere economic variables but most importantly, must adhere to ecological principles, especially in the world of agriculture.

5.4.2 Re-interpreting eco-dominion theology

Redeeming the divine vocation of caring for God's creation, as discussed above, has to go hand in hand with rediscovering or re-interpreting eco-dominion theology. The importance of this aspect in the process of creating an African Christian agro-moral vision in response to climate change is based on the fact that one of the problematic aspects in the theological discourse has been the understanding of the divine command to be faithful, to multiply and to have dominion on earth. For centuries it has been used to imply human superiority in the created order, hence seen as if it is sanctioning the exploitation of the natural environment for self gain. The aspect of responsibility embedded in it has always been pushed to the margin. Conradie (2011b:81) affirms this when saying "there has been always a danger of using such divine command selectively." Concurring with Conradie, McDonagh (1994:125) succinctly points out:

...the will to dominate the earth begins with an understanding that humans are radically different from everything else in the created order. It assumes that there is an unbridgeable chasm between humans and the rest of creation. Humans alone are endowed with spirit. They are unique in so far as they are created in the image of God. Humans are seen as superior to the rest of creation and in the same way not an integral part of it...the rest of creation is perceived as not having any sacred dimension.

This calls for a proper interpretation of biblical injunctions and place much emphasis on doing God's will. In the long run, this will influence and help Christian farmers to adopt the agricultural model of farming God's way, which is embedded in the agro-theological metaphor of "tilling and keeping the earth". Therefore, when thinking of "tilling and keeping" as an agro-theological metaphor for sustainable agriculture and as a model for farming God's way, the theology of dominion has to be redeemed. The notion of humankind being an irresponsible master of the world, as popularly understood, needs to be unquestionably rejected because it allows human beings to plunder and ravage the earth for its resources. The dominion command should not be interpreted as domination or military conquest but rather, in terms of caring, protecting, nurturing, gardening, cultivating and serving (Conradie, 2011b:82). This is what it means to be made in the image of God, as Nurnberger (2011:13) puts it:

...authentic human existence is defined by acceptable purposes, goals, norms and values. They are acceptable if they are oriented towards a vision of comprehensive optimal well-being at least within a limited horizon of collective consciousness at any point in time. To be authentically human, humans are expected to act consciously, responsibly, creatively and redemptively. Inauthentic human life, in contrast, is capable of acting mindlessly, selfishly and destructively.

In light of this assertion, interpreting the dominion command as human irresponsible mastery of the earth devalues the essence of being human in the image of God. Locating the notion of dominion in a wider perspective, Gnanakam (1999:54-56) underscores eight helpful ways in which divine command of dominion must be re-interpreted and understood:

1) Dominion in love. In biblical terms (e.g. Ez. 34) God is presented as a shepherd in contrast to the harsh and brutal kings who ruled Israel. In this context, the notion of dominion is placed alongside that of a caring shepherd and not that of a harsh and brutal leader. This implies that dominion has nothing to do with cruel, heartless domination but it is built on the foundation of the loving and caring relationship of the shepherd with his sheep.

2) Dominion within a commonality. The fact that human beings were made from the dust of the ground (Gen. 2:7) implies a link between humans and the earth community in its entirety. This is a typical ecological understanding of dominion. Dominion that is seen and practiced or exercised within this sphere of commonality always has a healthy perspective, i.e. a responsibility for the other, for the common good of all.

3) Dominion in creativity (Gnanakam, 1999:54). This suggests that God-given authority to humankind is not a mandate for destruction or the cruel treatment of the created order. In light of being created in the image of God, responsibility alongside God's creativity transforms authority into positive and productive expression. In creativity there is always intent "to bring something good even from the worst." While the resources that God entrusted to humankind are limited, they are all blessed with the "potential to multiply phenomenally", especially when used creatively, responsibly and with proper priority.

4) Dominion in the interest of others. In the dominion that God commanded there is no room for selfish interest. This is the case because “the ultimate dominion belongs to God alone.” Important to note in this aspect is that in any authority to rule, there is privilege as well as responsibility and once these two are separated, exploitation is inevitable.

5) Dominion in servant-hood. This means that human beings are made to serve God through serving the Creation.

6) Dominion with stewardship. The term steward denotes watchful care and preservation of the earth as the common home for all created beings. Unlike the popular understanding of the term to mean users, ecologically understood, its meaning shifts to ‘keepers’, and from ‘consumers’ to ‘conservers’. This means that on the basis of divine vocation, humankind is meant to serve, keep and preserve creation. In support of this position, Gousmett (1997:1) says:

The biblical perspective on the earth is rooted in the belief that the world and all that it contains was created by God and continually sustained and cared for by God. Human beings were created for two main purposes: Firstly, to have a fellowship with God and offer a loving response to His goodness to the world. Secondly, to care for the world He has made and to explore and uncover its richness, developing it in a responsible manner for the benefit of all. The two purposes behind God’s creative act are not separate. They are intrinsically bound up together. God’s desired to have a fellowship with the people He made stewards of the earth and as responsible steward of the earth, we must have fellowship with the one for whom we are stewards.

The two purposes of human beings reveal the existence of the covenantal relationship between humankind, God, and the rest of Creation. In this relationship, God and humankind are partners and the earth is the context in which “that relationship will be exercised while at the centre of it is care (Gousmett, 1997:1-2).

7) Dominion with respect. This has to do with a considerate regard for the rights and privileges of the entire earth community. According to McDonagh (1994:3-4), dominion with this respect is built on the biblical and Christian understanding that “the goods of this world are meant to sustain all forms of life on earth”.

8) Dominion in justice. This is a fundamental and integral part of the biblical tradition, revealing God’s way of dealing with the created order. One of the cries of Old Testament prophets to God was “let justice flow in their attitudes and relationships...” The

sabbatical and jubilee principles also served as checks and balances on human desire and greed for accumulation by continually harvesting without consideration for the earth (Gnanakam, 1999:56).

A lesson that can be discerned based on the eight principles of dominion as articulated above is that: the dominion that God sanctioned is different from the actual dominion practiced by humankind throughout. Dominion permeated by God has to do with rendering service to the earth and hence protecting its integrity to sustain life. Any dominion practiced in this sense offers a new way of living and relating to the natural created order and it is born out of a radically new vision of God who takes sides with the marginalised. Guided by such an understanding of the divine command of dominion, human society, especially farming communities in the time of climate change, will be able to develop a Christian agro-moral vision that promotes more life-enhancing farming alternatives.

The central point in the whole issue of dominion is the responsibility embedded in it, i.e. the responsibility to care for creation while harnessing its richness in a sustainable manner and for common good. This responsibility has largely been downplayed by the sinful nature of human beings because, adds Gnanakam (1999:57), where there is sin any kind of relationship can be exploited. While claiming equal status between humankind and creation would be the ideal, above all, the right relationship of humans to nature should be based on the principle of responsibility, solidarity and peace. However, in this kind of relationship, the chief requirement is the need for humankind to exercise its God-given responsibility of protecting life through caring for creation in order to fulfil God's plan for all creation. Gnanakam (1999:57) continues to state:

The biblical teaching of dominion when fully explored is not domination. It is a stewardship with an authorisation to maintain God's creation. The appropriateness of the stewardship theme is that while it places humankind in the centre, it does not sanction any exploitative position of humans above nature.

Viewed through the lens of scripture, engraved in the concept of dominion is responsible stewardship over creation. Emphasising the richness of stewardship as biblical concept, Clint Le Bruyns (2009:71) argues "the doctrine of stewardship is an important biblical concept that serves as promising theological resource for responding redemptively to the economic ambiguities within contemporary society so as to foster a more life-giving

economy and world.” Moreover, Butkus (2002:17) puts it this way: “we are called to have dominion over the earth. This does not mean to exploit, but to exercise responsible stewardship of care and responsibility for God’s sake.” Given that Christians are the people whose lives are shaped by biblical faith, the crisis underway creates an opportunity to rediscover the role of humankind on earth, pushing people to affirm the biblical theology of creation which entails a delicate, fragile system of inter-related parts which is maintained and enhanced by the recognition of limits through judicious exercise of moral choices (Butkus, 2002:18). Such moral choices should not reflect an anthropocentric position or dominion as domination but should rather embrace a vision of ecological dominion of responsible stewardship and care.

5.4.3 Reclaiming African cosmo-vision to enhance agro-moral vision

The term cosmology originates from the Greek words *Cosmos*, which means the world, and *logos*, referring to discourse (Hathaway and Boff, 2010). Therefore, in the academic sphere, cosmology is a branch of philosophy which studies the origin, structure, and development of the world or universe in general (Udefi, 2012:60). Loosely defined, it is a branch of metaphysics after ontology (a study of meaning and nature of being), which reflects on the universe as an ordered system. As in other traditional cosmologies, African cosmology is characterised by a number of tenets that constitute potentials for the current ecological liberation struggle (Hathaway and Boff, 2010: 132). The first tenet holds that at the heart of African cosmology lies a myth about creation which involves issues concerning the role of humankind in the world, the human relationship with other creatures, and how to re-establish harmony in the face of imbalance. In the second precept, the entire cosmos is viewed as being a living organism, an interconnected web of existence.

Thirdly, humankind considers itself to be part of many beings and the cosmos is depicted as a common home where people must endeavour to work and live in harmony. Fourth, land is understood holistically, not as a mere collection of natural resources but as a place where all living beings belong. Fifth, a sense of kinship, inclusion, cooperation, and reciprocity, rather than competition and personal gains, are highly valued and respected. Sixth, the purpose of life is considered in terms of harmony, balance and sustainability,

rather than in terms of unsustainable progress, growth and economic development (Hathaway and Boff, 2010:133-134).

Therefore, traditionally, an African worldview is a basic reference point of social order, economic survival and the healing of illnesses. However, due to modernity, this situation has been either overpowered or marginalised. Explaining this further, Nurnberger (2011: 12) says:

The modern humans have shed their accountability to a transcendent, all embracing authority, appropriating for themselves the role of owners, masters and sole beneficiaries of reality. Overriding obligations and commitment are disappearing in vast sections of the population.

In this assertion the author reflects on how humankind has, in the contemporary era, disconnected from the rest of creation, taking up a transcendent position. Such movement has emerged in the name of modernity and advancement of science, technology, and consumer behaviour, backed up by economic growth or neoliberal economic ideologies. It means that humankind has adopted a mechanistic worldview which allows for the manipulation of natural resources, hence exacerbating the environmental crisis, climate change and many other environmental problems. This suggests the need for revisiting the human cosmological vision. For Christian faith communities, such a cosmovision has to be based on biblical faith. Butkus (2002:19) articulates six salient features of biblical creation theology that are helpful in rediscovering a cosmovision in the context of climate change - a human induced phenomenon:

1. The origin of the universe is the sovereign, creative and sustaining power of God. It means that the universe is theocentric.
2. Creation is not a singular event but rather an ongoing process that needs the continued presence of God's sustaining power.
3. The fact that God created order out of primordial chaos suggests that order stands at the centre of creation. Since this order constitutes both moral and physical nature, it requires ethical behaviour to maintain the harmonious functioning of the earth.
4. Creation is the relational entity that works harmoniously where every creature fulfils its appointed place and function within the grand design.

5. God is the principal or supreme author of the meaning and values of creation.
6. God is both transcendent and immanently present within creation; therefore, creation discloses both the nature of God and human vocation within God's world.

From the six features outlined above, there are three key lessons that can be discerned. The first one has to do with the fact that God has got a strong bond with the creation that He created. Secondly, the whole universe is a system functioning together and no dichotomous relation exists among the elements of creation. Thirdly, human moral treatment of creation should maintain the harmonious functioning of the earth. Therefore, the integral relationship between various constituents within creation is critical. This is what ecology is all about. Ecology signifies “interrelationship within the natural order and when such relationships are disrupted and upset the result is chaos” (Gnanakam, 1999:44). Unlike the biblical worldview discussed above, the mechanistic view of the world, continues Gnanakam, shows that:

Human beings have tended to see their relationship to creation only in terms of its utility rather than in terms of identity [intrinsic values]. If we have a common God who created everything and a commonality even in terms of constituent elements within us, then our relationship needs to be seen in a common identity. Exploitation and imbalances in the world prevail whenever identity is confused and relationship is minimized. While we cannot relate human and nature in biocentric equality, this does not negate God's intended relationship of respect, care and love in stewardship.

It means that for humankind to be able to exercise its God-given responsibility and care for the natural world, the current mechanistic worldview has to be replaced with a holistic worldview which embraces the interconnected nature of the world. In this interconnectedness, each constituent of creation has a significant role to play in the process of ensuring that earth continues to be a liveable planet. Unlike shallow ecological thought which tries to encourage people to save the natural environment because it is useful to humanity, deep ecology insists that humanity and the natural environment are inseparable. Humanity is an integral part of the natural world - “a planet of the greater web of life” in such a way that an unhealthy ecosystem leads to unhealthy humankind (Hathaway and Boff, 2010:63). That is why climate change, resulting from unhealthy ecosystems, has a serious impact upon human life (see chapter three of this study).

Of the eight principles of deep ecology proposed by Arne Naess (1972), the first four principles explicitly emphasise the interconnected nature of life on earth. The first principle states that the well-being and flourishing of human and non-human life on earth have value in themselves. The second principle argues that the richness and diversity of life forms contribute to the realisation of these values and are also values in themselves. The third highlights that humans have got no right to reduce this richness and diversity, except to meet their vital needs. The fourth principle contends that the flourishing of human life and culture must be compatible with a substantial decrease of the human population (Gnanakam, 1999:22; Naess, 1972:2). Such a holistic worldview can be depicted in the African context, where the concept of community, as discussed earlier in this chapter, governs the ways that people relate to one another and to the natural world.

According to Shutte (2001:12), the ideal of community implies an interpersonal relationship and beyond. In line with Shutte, Gitau (2000:41) contends that in the African worldview, human beings are not considered isolated creatures, rather they are always considered part and parcel of the universe as a whole, all of which depend on God the Creator for their existence. On the same note, Buthelezi (1987:95) reiterates that the African worldview puts life at the centre of all human activities. In the African perspective, community means the unity of life. Life is the first constituent that links members of the community together. Explaining this further, Kyomo (2000:58) points out that in the African worldview, life occupies the entire physical world and that all members of the human community are responsible for caring for, and for sustaining this life. A healthy life can only be achieved when effective healing that involves reconciliation with the entire cosmos is taken into account. In this regard, the human community and the cosmos complement each other in such a way that they cannot exist healthily without this interdependence. Furthermore, Kyomo (2000:59) argues:

Abundant life means human beings should respect God's creation. They ought to live according to the guidelines and rules that are aimed at preserving life on this planet earth. Morally, they should live according to this criterion: good acts are those that sustain and enhance life whereas bad acts are those that diminish life.

This is a clear indicator that in the African worldview, there is ecological wisdom that might be helpful in rediscovering a cosmivision that strives to protect life on earth through protecting the integrity of creation. In the face of climate change which results

from an individualistic worldview, adopting a holistic worldview is not an option. It is for this reason that when reflecting on the “Africanization of knowledge”, Viriri and Mungwini (2010:30) point out that in analysing and crafting an African response to issues that are of threat to life, the African worldview must be put at the centre. This is in recognition that there are different forms of knowledge construction, and that none of them can be regarded as superior to the others. Bujo (1998:208) affirms this when he says “...It should be recalled that the African people are characterised by a holistic type of thinking and feeling. For them there is no dichotomy between sacred and the secular and they regard themselves as being in close relationship with the entire cosmos.”

5.5 Chapter summary

This chapter was set out to provide some insights regarding an African Christian agro-moral vision as theological response to issues of climate change in the world of agriculture. It has been exhibited that climate change has a moral-theological dimension in the sense that it threatens the sustainability of life on earth, the well-being of all creatures, and raises issues of injustice, especially regarding people at the margins of society. Linked to this finding, the chapter went on to highlight the nature of existing Christian ethics where it was evident that the current framework in which Christian ethics operate is Western oriented and individualistic in nature, thus insufficient in responding to the moral dimension of climate change in the world of agriculture especially in African context, Tanzania included.

The chapter further articulated the re-envisioning of Christian ethics which can potentially enhance an agro-moral vision in response to challenges of climate change in relation to the world of agriculture. Furthermore, it has been proposed that in the process of re-envisioning Christian ethics to enhance agro-moral vision, three major theological aspects are to be taken into consideration. These are redeeming the divine vocation of caring for the earth, re-interpreting eco-dominion theology, and reclaiming an African cosmivision. In the world of agriculture, this will potentially allow farming God’s way to take place as a means of reclaiming the divine vocation to care for the earth.

However, given that the current Christian ethics is basically Western oriented, such an agro-moral vision must be rooted in the African soil. This means that it must deliberately tap into African indigenous knowledge systems, which can potentially enrich efforts to curb challenges of climate change and its impact on the world of agriculture. It is for this reason, therefore that the following chapter will explore the African indigenous knowledge systems which has the potential capacity to enrich an African agro-moral vision which will in turn influence life-enhancing agriculture in the context of climate change, particularly in Tanzania.

CHAPTER SIX

AFRICAN INDIGENOUS ECOLOGICAL KNOWLEDGE TO ENHANCE AGRO-MORAL-THEOLOGICAL VISION IN RESPONSE TO CLIMATE CHANGE

African Indigenous Knowledge systems, beliefs, and practices amply demonstrate an advancement of the African people's ecological conservation methods, agricultural and scientific methods, sculptures, basketry, pottery, and medical practices (Gudblanga and Makandze 2012).

6.1 Introduction

Chapter five provided some insights on an African Christian agro-moral vision as an imperative theological response to issues of climate change in relation to the world of agriculture. This involved articulating the moral-theological implications of climate change in relation to agriculture, ascertaining the nature of the current Christian ethics, and re-envisioning Christian ethics to enhance agro-moral vision. Guided by the principles of responsibility and ecological transformation of the human psyche, this chapter intends to explore African indigenous ecological knowledge as a necessary component in which an African agro-moral vision must be rooted. The chapter thus contributes to addressing the question central to this study which, in the context of climate change, seeks to find out ways to cultivate an African Christian ethic of care in the world of agriculture, with reference to the Tanzanian context. The chapter is divided into five sections. The first section gives an overview of African indigenous knowledge systems and scientific knowledge in general. The conceptualisation of African indigenous knowledge will be discussed in the second section, while the third section specifically focuses on African indigenous ecological knowledge. Harnessing the potentials of African indigenous ecological knowledge for a life-centred agriculture will be discussed in section four, while section five deals with the importance of integrating African indigenous ecological knowledge into an agro-moral-theological vision to promote sustainable agriculture, human responsibility and care for the natural environment to curb the adverse impact of climate change.

6.2 African indigenous knowledge and scientific knowledge

As discussed in chapters three and four of this study, discerning the intrinsic link between climate change, agriculture and theology is a critical aspect for both the development of agriculture and for mitigating the adverse impact of climate change (Paul et al, 2009:39). However, the current initial efforts to address the effects of climate change have largely been concerned with technical aspects and, therefore, depend strongly on scientific [western] knowledge. Nyong et al (2007:788) have argued that, apart from the fact that indigenous knowledge system has been recognised in the design and implementation of various sustainable development initiatives around the world, not much has been done to incorporate such systems of knowledge into climate change debates. Explaining this further, they state: “Incorporating indigenous knowledge into climate change discourse can lead to the development of effective mitigation and adaptation strategies that are cost effective, more participatory and sustainable” (Nyong et al, 2007:788). This does not mean that indigenous knowledge system should replace scientific knowledge, but, rather, it calls for the need to acknowledge that various forms of knowledge may complement each other, instead of competing, and thus may enrich efforts to address issues of climate change and environmental problems, especially in the world of agriculture.

Regarding scientific and non-scientific ways of ‘knowing the world’, scholars are, according to the existing literature, divided into two schools of thought. Ross et al (2011:33) describe the first school of thought as comprising of pro-scientific knowledge scholars. Scholars adhering to this school of thought advocate for the distinctive and superior nature of this form of understanding the world. They claim that knowledge, produced following scientific methods, is superior to, and more reliable, true, and genuine than any other form of knowledge. On the other hand, there is a school of thought which has its roots in the extreme postmodernist form of cultural relativism, a philosophical position according to which there is no single absolute view or way of knowing. Scholars of this school reject the notion that scientific knowledge should enjoy a special status. They contend that science should not be used to label a certain form of knowledge as privileged, thus denigrating and marginalising other forms of knowledge and thought.

Critiquing the perceived superiority of Western scientific knowledge further, Doxtater (2004:618) points out that, in contemporary society, scientific knowledge faces two critical dilemmas. Firstly, scientific knowledge “rests on the foundation of reason” in order to understand the true nature of the world. Secondly, it sees itself as superior to all other knowledge and as having power and authority to “authenticate or invalidate other forms of knowledge.” This indicates that proponents of scientific knowledge are unconcerned with other forms of knowledge and only wish “to validate their own master narrative” (Doxtater, 2004:618).

Judged by the limited amount of available literature, African indigenous knowledge system has been severely marginalised, like any other indigenous knowledge systems in other parts of the world. In this regard, Gudhlanga and Makaudze (2012:71-72) argue that Westerners, upon their encounter with the African continent, considered indigenous knowledge which includes values, beliefs and practices that do not conform to Western norms, as offensive and distasteful. On this basis the process of colonisation was perceived as a way to civilise the uncivilised Africans. Lazarev (1994:56), reflecting particularly on participatory eco-development with a focus on sustainable agriculture, argues that the truth of the matter is that indigenous communities have for many years had their own ways of producing knowledge and of using such knowledge to sustain themselves and to address challenges they faced. Due to the dominating position of scientific knowledge, such indigenous knowledge was negatively viewed by most agronomists and technicians, terming it “archaic, insufficient and irrational” (Lazarev, 1994:56). Emphasising this point, Lazarev posed that these agricultural experts, with the supremacy of their scientific knowledge foremost in their minds, remained for many years unaware of the potential and the richness of traditional agricultural practices. On the basis of these same insights, Fabricius (2004:39) asserts:

The coming of the Westerners turned down the spiritual and traditional agenda driven by the communities who live close to the natural environment and who are dependent upon them for survival. These Westerners began to promote materialist, capitalist agendas driven by the private sector and by individual members of their communities who choose to have a more selective engagement with conservation, egalitarian or traditional and who see wild plants and animals as the road-block to affluence.

Moreover, Ross et al (2011:61) point out that the modern sciences, as they are called today, or scientific forms of knowledge, are the result of a particular set of historical events. It is these events which have created a context for a fundamentally new form of social organisation in Western Europe, known today as ‘imperialist capitalism’. This new form of social organisation “transformed not only assumptions and ideas surrounding knowledge but also the entire social, economic and political fabric of European life” (Ross et al, 2011:61). As this scientific knowledge was emerging during the 16th and 17th centuries, other forms of knowledge production were prevalent in other parts of the world. This affirms that indigenous knowledge existed but, as Western scientific knowledge gained superiority, such knowledge was “deemed to be constructed outside the truly scientific paradigm, hence incomplete”, and as insufficient compared to Western scientific knowledge (Ross et al, 2011:62).

The literature indicates that the manner of the marginalisation of African indigenous knowledge by scientific knowledge can be summarised in two main categories. The first category is epistemological in nature which refers to a science of human knowledge, its nature, scope and sources. Being concerned with how knowledge of reality is obtained, Jupp (2006:92) contends; the Western epistemological framework could not recognise the value of African indigenous knowledge which has been a critical resource providing indigenous communities with the wisdom needed to address various challenges, including climatic variability. This was the case because Westerners tended to have a narrow view of traditions and customs that were non-Western. Hence, the opportunities for indigenous knowledge to be given recognition were considerably reduced, even in contemporary communities (Ross et al, 2011:95). Because of the non-validation of African indigenous knowledge by Western epistemological orientation, existing expertise in African indigenous communities and their connection to the natural environment were never proved to the satisfaction of scientists and resource management agencies.

The second category of marginalisation refers to systemic or institutional concepts used by Western scientists who are ‘outsiders’ to indigenous communities, to create an ‘outsider-ship’ for indigenous knowledge. During the colonial system any element of African indigenous knowledge was viewed as something to be avoided or overcome and its legitimacy was questioned in its entirety. Where colonizers implemented development projects, for example, especially in the least developed regions, African indigenous

knowledge was deliberately ignored on the basis that the Western modes of knowledge were perceived as superior and absolutely valid (Ellen and Harris, 2000:11). In spite of the marginalisation of indigenous knowledge sustained over a long period, literature reveals that there are today an increasing number of studies available that affirm the value of African indigenous knowledge and that they acknowledge that it has the potential capacity to address challenges of ecological conservation today.

This new respect for indigenous knowledge is based on the fact that “knowledge and land use are intimately bound to one another as belief widely shared among the African indigenous people” (Whitt et al, 2001:3). Moreover, in African indigenous communities, people are aware of their responsibility to and for the natural environment. The awareness stems from the way that they understand the relatedness or affiliation of human beings and non-human nature. This was made clear in the study, conducted in Tanzania by Wijzen and Tanner (2000:61), where the *Sukuma* community was seen as having a strong connection to their natural environment, associated with the belief that the ancestors would be displeased if care for natural environment was not taken seriously.

Furthermore, Kenalemang and Kaya (2012:22) disallow the tendency of colonial and apartheid historians to label pre-colonial Southern African communities as incapable of controlling and managing their natural environment, describing them as too useless, lazy and ignorant to conserve the soil through fertilization and prevention of erosion (Kenalemang and Kaya, 2012:25). Based on their extensive research aimed at revealing the potential of African indigenous knowledge, they “testify to the vast ecological knowledge of African indigenous farming practices”. For example, applying their indigenous knowledge, farmers were able to use trees and grasses as indicators of “the quality of soil and its suitability for specific types of crops” (Kenalemang and Kaya, 2012:26).

In the framework of the perceived relatedness of humans and nature, African indigenous people are aware that they have a role to play as guardians and protectors of all forms of life in their engagement with the world of agriculture. This guardianship becomes the moral responsibility of every individual in the society as the entire community is “held by and indebted to its relational ties with the non-human creature” (Whitt et al, 2001:4).

These ties tend to be both prescriptive and descriptive in nature, suggesting “ways in which it is appropriate or inappropriate to behave” in everyday life.

Epistemologically, Western scientific knowledge tends to separate “spiritual from material, religion from knowledge, and culture from nature” (Pierotti, 2011:215). This kind of dissected worldview is not shared by the African indigenous cultures whose philosophy is based on a holistic cosmovision (Pierotti, 2011:216). Unlike indigenous knowledge, scientific knowledge is described as experimental (deduced from hypotheses which are tested), systematic (results can be replicated) and universal (results are independent from the context since variables are isolated and controlled). Conversely, indigenous knowledge is more practically oriented (determined by immediate need and utility), local (only applicable in the setting in which it was developed) and contingent (meaning that such knowledge works in a specific context or in the specific environment of a particular community) (Pierotti, 2011: 217; Seleti and Kaya, 2012:307).

The recognition that all aspects of nature, human and non-human, are related and indebted to one another implies the need for behaviour and actions that demonstrate respect for one another. This is a moral principle, very basic to indigenous knowledge. When speaking about human and non-human creatures, respect has to be understood as a matter of “appreciating the inherent value” of other entities and of activities and services rendered by the natural world (Whitt et al, 2001:13). An appreciation of the inherent value of the non-human part of creation, and its close interrelationship with humanity, also involves the need to develop knowledge of the integral role that ecosystems play in sustaining the natural order. This can be achieved by addressing questions such as “what does that role consist of, how is it played out and what are its limitations, constraints and possibilities?” (Whitt et al, 2001:13).

In the African context, Mkhize (2008:37) states, this approach is best described by the notion of “cosmic unity” or “holistic conception of life” where everything in the universe is perceived to be in motion, each element influencing every other one. This means that knowledge production is relational and is achieved through participation in a dynamic process involving “interaction” among all created beings. Traditionally in the African context, each individual is seen as having duties and obligations to fulfil, not only for the benefit of fellow human beings but – and equally important – for the sake of the natural

environment. These considerations together lead one to behave respectfully and to avoid behaviour that might diminish life's harmonies, while adopting actions that facilitate the continued functioning of natural ecosystems (Whitt et al, 2001:15). Doubtlessly, in this regard, indigenous knowledge contains valuable potentials that can be harnessed and integrated into promoting sustainable agriculture in the context of climate change. This is possible because, traditionally, African indigenous people believe that life is the "basic form of reality", while simultaneously being cognisant of the fact that life is constantly under threat of various forces. Therefore, identifying 'enemies' of life and finding ways to protect life, especially life as supported by the natural environment, is central to African concerns (Bujo, 2009:282).

6.3 Conceptualising African indigenous knowledge

African indigenous knowledge, also known as traditional or local knowledge, refers to the knowledge and skills, gathered across generations, which guides indigenous communities in their interaction with the surrounding natural environment and managing their daily lives (Nakashima et al, 2012:29; Ross et al, 2011:32). It is an accumulative body of knowledge resulting from lifelong practices, beliefs and experiences as indigenous communities strove to adapt to varying circumstances. More important, such a body of knowledge is unique to a particular local community. It is traditional in nature, deeply embedded in the experiences of the community concerned, and developed over a length of time on the basis of observation of mechanisms that enable the community to adapt to specific local conditions (Kenalemang and Kaya, 2012:40).

This knowledge is tested and handed down over generations. Odero (2011:5) further describe indigenous knowledge as the particular knowledge of local people, which exists outside the framework of the popular formal scientific knowledge. Although many consider it to be simple, as compared to scientific knowledge, Nakashima and Rove (2002:215) argue that "African indigenous knowledge is a complex array of knowledge, skills, practices, and representation that guides and shapes human societies." This shaping process results from the numerous relationships with natural systems that confront people in their economic activities such as: agriculture and animal husbandry; hunting, fishing and gathering, the struggle against diseases and injuries, naming and

explaining natural phenomena, and the devising of strategies for coping with the changing environment.

It is a fine-tuned interplay between society and natural environment that generated the development of African indigenous knowledge systems with their various structures, contents, and complexities, geared towards usefulness, pragmatism and distinctiveness. The difference between indigenous knowledge and Western scientific knowledge is clear. Western scientific knowledge is abstract in nature, relatively independent from practices and lived experience, whereas African indigenous knowledge is the result of practice and lived experience.

Taking this argument further, Kiplang'at and Rotich (2008:719) point out that, after conducting an extensive study on this topic in Kenya, they concluded that indigenous knowledge is the basic component of the country's knowledge. This is so, because, by its nature, African indigenous knowledge encompasses the skills, experiences and insights of people which they apply to maintain and improve their livelihoods and to express their cultural values. Such knowledge constitutes their social capital and is a key asset in their struggle for survival, in the production of food and shelter, and in their attempts to attain control of their lives. By its nature too, this knowledge aims to ensure harmonious relationships between humankind and the natural environment. It therefore offers valuable insights on how to address issues relating to the causes and consequences of climate change (Cobb, 2011:1-2).

Literature indicates that there are four distinct characteristics of African indigenous knowledge which plead for its integration into sustainable agriculture. The first characteristic is that it embraces the holistic nature of life (Cobb, 2011:4). This resonates with the African worldview where oneness and togetherness (communal life) are central. The holistic conception of the natural and the social world characterizing African indigenous knowledge, is informed by the view that all things in the universe are connected, denoting the concept of ecological community, unlike scientific knowledge which is highly specialised and categorised. Bujo (1998:208) contends, in this regard:

African people are characterised by a holistic type of thinking and feeling... they regard themselves as being in close relationship with the entire cosmos. The total

realisation of the self is impossible as long as one does not peacefully co-exist with minerals, plants and animals.

The second category has to do with ownership. The fact that African indigenous knowledge is locally based suggests that it is specific to particular communities and their ways of life. Although the individual possesses indigenous knowledge, it is communally managed and shared. Cobb (2011:716) highlights: “indigenous people would [...] suggest that a sound knowledge and sound natural resources stewardship demand uniting the head and the heart, valuing personal experience and connections to people and the land.” African indigenous knowledge in general views humankind as part and parcel of the ecological system, with human beings carrying a special responsibility to sustain its healthy natural functioning.

The third characteristic is that African indigenous knowledge is community centred. Ross et al (2011:34) emphasise that such knowledge is “intricately bound to a particular community and place as well as to the whole way of life.” The fourth characteristic is that African indigenous knowledge is place-oriented in the sense that it is closely tied up to specific physical localities whereby all aspects of physical space are considered to be part of the community. In other words, the knowledge is developed in a particular place where a particular community is located, leading to an intimate and unique understanding of the area and its natural environmental setting (Menzies and Butler, 2006:3-4).

On the basis of these distinctive characteristics, it is clear that indigenous knowledge is made up of people’s experience and interaction with their natural environment where they live. Therefore, incorporating it into dealing with climate change in general, and into life-enhancing agriculture in particular, would offer opportunities to expand and strengthen conservation and the mitigation of the challenges posed by climate change. Using various forms of knowledge to address current environmental problems is important; given the reality that scientific knowledge alone cannot move environmental problems beyond their current state (Cobb, 2011:3; Kiplang’at and Rotich, 2008:720). This calls for the need to firstly acknowledge local knowledge and subsequently incorporate it in various efforts to address the challenges of the day, including integrating such knowledge into agriculture and climate change efforts.

Selvamony (2010:137) contends that it is becoming evident that addressing climate change and environmental degradation is not possible without reconstituting the harmonious relationship of humankind with the planet as it existed in pre-industrial communities. Therefore, the current study proposes that the helpful knowledge and skills that generation of indigenous people have deployed as they struggled to deal with their contemporary challenges of their environment, should not be devalued and neglected in the light of modern technological and industrial advancements. Rather, ways should be sought to enhance, improve and integrate such knowledge for the benefit of the respective communities. Moreover, to avoid the continuation of hegemony of Western knowledge (Ross et al, 2011:1), finding, identifying, collecting, generating and documenting such knowledge is critical.

6.4 Uncovering African indigenous ecological knowledge

It is widely recognised that for centuries farming communities have been developing complex, diverse and locally accepted agricultural practices. These practices constitute a combination of indigenous techniques and practices which ensure both “community food security, conservation of natural resources and biodiversity” (Altieri and Koohafkan, 2008:14-15). Despite the advanced progress that can be found in various parts of the world, these traditional and indigenous farming systems do still exist in many places throughout the world.

Therefore, as discussed in the first two sections of this chapter and based on literature, indigenous ecological knowledge is part and parcel of indigenous knowledge. According to Eyong (2007:127), African indigenous people have, since times immemorial, developed and applied a number of indigenous ways of doing agriculture. These farming practices have been transmitted from one generation to the next. Such agricultural methods, when scrutinized, reveal a wealth of knowledge that can be harnessed in today’s search for more sustainable and life-enhancing agriculture that mitigate climate change, a human induced phenomenon. Such indigenous farming practices include “land tilling, selecting seed varieties for planting, planting techniques, harvesting and storage”. Kiplang’at and Rotich (2008:720) state that some of these indigenous farming practices are still predominant in many parts of Africa, especially in Tanzania where more than seventy percent of the population sustain their lives through small scale farming

activities, despite the sustained influence of modern farming practices and economic globalisation.

The literature confirms that most farming communities, especially in rural areas where small scale farming is practiced, are still applying indigenous ecological knowledge in farming activities and in many other areas of life, because it works out cheaper and employs locally available materials that are easy to adapt and to use, as compared to modern farming technologies. Claxton (2010a:1-2) astutely comments in this regard:

The indigenous ecological knowledge of the people in the global South constitutes the world's largest reservoir of knowledge of diverse species of plants and animal life on earth. For many years their indigenous agricultural systems have utilised practices and techniques which embody ... the continuation of cropping all year round without the use of much agro-chemicals which degrade the natural environment. They do not deplete the earth's natural resources instead they often replenish them.

In their acknowledgement of the existence of this particular knowledge and its potential, modern scientists have been using terms such as ecological agriculture, organic farming, and conservation agriculture to explain indigenous farming practices and techniques (Claxton, 2010a:2). This indicates the growing consensus among scholars that indigenous ecological knowledge and the application of life-giving agricultural practices should play an integral role in the building of a position of resilience as regards climate change (Midgley, 2011:8-9). Midgley (2011:9) continues: "the existing knowledge which is adaptive to local practices can be harnessed and tailored to ensure communities are able to reduce their vulnerability to climate change as they adopt life-centred agricultural practices."

Berkes (1993:4) reiterates that, by nature, local ecological knowledge is qualitative, intuitive, and holistic. It refers to the interconnectedness of the natural and social worlds, it has a moral character, and it is empirical, based on observation and on the accumulation of facts selected through trial and error. It also has a spiritual content which is produced by the resource user. Hence, local ecological knowledge has a critical significance in both its social and cultural dimensions. A central point of local ecological knowledge is that it offers a way of life for the entire community and its natural environment. Harnessing its wisdom will widen the horizon in the search for a life-

centred agriculture and mitigation of the challenges of climate change, thus strengthening current natural resource management and creating more realistic developmental and economic plans.

For Shukla (1993:1-2), tapping into traditional ecological knowledge, held by people in local communities, means strengthening a community based conservation system. More importantly, it entails organising and mobilising local communities at grass root levels to participate in such efforts. This is the case because, Miller (2010:200) argues, in the local communities both men and women are considered as custodians of indigenous knowledge. All members of the community are in possession of ecological knowledge. From their own experience they know what is, or is not, valuable knowledge (Schaefer, 2009:6). For this reason local knowledge may be referred to as the wisdom of a people concerning its survival in its environment and covering the whole range of skills of a particular group (Mwaura, 2008:32). It is called 'wisdom', in part because its content is not confined to one aspect of life but it covers a range of topics covering a particular community and its members from all walks of life. By virtue of the diversity of these topics and their use in decision-making, such knowledge may be viewed as a vital resource for advancing and transforming life-centred agriculture.

Moreover, taking into account indigenous knowledge will, according to Abrams, Eno and Ormsby et al (2009:800), lead to a paradigm shift from the traditional top-downward conservation approach to bottom- up conservation strategies. In this way the world would be "driven by a commitment to grassroots conservation" approach (Abrams et al, 2009:800). The grassroots approach to conservation would create a more sustainable growth rate in the agricultural sector, as opposed to the current unlimited growth which is deemed to be unsustainable in many aspects. Its disbursement of resources would adhere to the principles of environmental justice. Such a shift would lead to an economic model that strikes a balance between economic advancement and a sustainable use of natural resources. In the light of their experience and knowledge, people at grassroots levels would own their specific local conservation agendas and become more activated and empowered. They might even be enabled to convert scientific knowledge and forms of intervention into strategies that could be absorbed into their own conservation programmes in order to generate environmentally creative change and greater wealth, while enhancing biodiversity. Emphasizing the need to accommodate African ecological

knowledge in the quest for a life-centred agriculture and in the face of climatic variability, Abrams et al (2009:801) further state:

The time has come to establish an African conservation identity whereby people living off the land (as is common throughout African societies) are responsible for identifying conservation priorities and designing research programmes determined by and compatible with local experiences... This process will allow African indigenous people to take ownership of the mechanism of power and environmental justice at the grass root level and at the level of their own government.

On the whole, this argument fits in with the recognition of the intrinsic value of the natural environment, the value of local economies and retrieval of the lost or destroyed biblical vocation to be guardian and custodian of the earth's resources. Concurring with this view, Davis (2009a:104-105) offers the following remarks:

From a Biblical perspective, farming is the primary vocation 'serving and preserving' the fertile earth. The land itself is the medium or even the agent through which we can experience life as divinely blessed or conversely accursed. Any economic [system] that negates this essential vocation is necessarily unjust for justice and vocation are inseparable... It is by way of the principle and practice of vocation that sanctity and reverence enter into the human economy. It was thus possible for traditional cultures to conceive that 'to work is to pray.'

Injustices in the current agricultural system in Tanzania, as in other African countries, are evident, especially in the rural areas. The existence of systemic injustices signals an unhealthy economic system in the sense that people are forced to adopt dominant and unsustainable farming approaches that they cannot afford and that are detrimental to the ecosystems that support agricultural production. The result is a decreased ability to handle the threat of climatic change. In this context, various forms of knowledge need to be brought together in a bid to create healthy economic systems that allow for life-centred agricultural practices.

6.5 Potentials of African ecological knowledge to enhance agro-moral vision

From literature analysed and discussed in the previous discussion, it is clear that African indigenous ecological knowledge can offer a significant contribution to the development of agro-moral-theological vision that mitigates life-denying impacts of climate change. In

this regard, Claxton (2010:2) reiterates, as indicated in chapter three of this study, industries, agro-chemical agriculture, deforestation and transport are the key sectors responsible for high emissions of GHG which contribute to global warming and climate change at large. IPCC has proposed Carbon Capture and Storage (CCS) as the principal and most effective technique for minimizing, or for total removal of, carbon gases from the atmosphere. However, recent studies reveal that ecological agriculture, as compared to CCS, appears to be better equipped to sequester carbon from the atmosphere and does so more cheaply and effectively. In relation to the current debate on global climate variability, Claxton (2010b:19) is of the opinion that:

Agriculture is an undermined and under estimated climate change tool that could be one of the most powerful strategies in fighting against global warming... Improved global terrestrial stewardship, that specifically includes twenty-first century regenerative agricultural practices, can be the most effective currently available strategy for mitigation of the CO₂ emission. Agricultural carbon sequestration has the potential to substantially mitigate global warming impact. When using biological regeneration practices, this dramatic benefit can be accomplished with no decrease in yield or farmers' profit.

In the light of this sentiment, the call is extended to adopt an agro-moral-theological vision that can reduce the contribution of agriculture to the problem of climate change, that is inexpensive to implement and easily accessible to the small holder farmers who constitute the larger part of the working population, especially in Tanzania. In truth, however, the sustained use of modern agricultural techniques, as discussed in chapter three of this study, has thus far hindered the integration of African ecological knowledge into daily agricultural practice for the sake of enhancing life-centred agricultural practices. Affirming this reality, especially in the Tanzanian context, The Danish International Development Agency (DANIDA, 1998:16-17) states:

The use of chemical fertilizers and GMO seeds may lead to increased highest yield at least in the short run. However, such farming systems in Tanzania have made far greater damage on soil and tree cover than the natural processes of regeneration have been able to withstand. The attractive nature of modern farming, inter alia, has led to increased pressure on natural resources. It is clear that without sustained effort to protect the natural environment, the long term prospects for agricultural and livestock production to improve national living standards is extremely gloomy.

This suggests the urgent need for integral environmental conservation strategies in all sectors and, in relation to the current study, specifically the agricultural sector. Measures have to be taken, regardless of the fact that, at the moment, there is enough surplus land in Tanzania. Putting appropriate strategies in place can potentially allow for prompt action to prevent irreversible ecological damage. Otherwise, the damage caused to the environment will continue to adversely affect people's living standards, workloads, food security and general welfare, whereas economic development will keep on being frustrated. The main reason propelling the potential of local ecological knowledge for the promotion of a life-centred agriculture is the fact that this knowledge is the result of long-term generational transmission and offers a unique historical perspective on local people's risk adjustment options. Therefore, modern scientists and theologians can benefit richly from such alternative knowledge (Lalonde, 1993:55).

It is evident from the literature that African indigenous communities use their ecosystem knowledge to understand and address various changes in their environment. This knowledge may concern soil classification, use of local plants and forestry products and animal behaviour. Africans have also developed adequate hunting skills, firewood provision and integrated pest management, control of soil erosion, soil fertility and food management. They apply, in short, a wide range of effective agronomic practices, including soil and water conservation skills. Based on this kind of knowledge, indigenous people in Tanzania, as elsewhere on the African continent, have continued to employ environmentally sensitive practices on the basis that these have served them for many years, as opposed to Western modern farming methods. The following are some examples of these practices, all of them containing wisdom with the potential of promoting a more life-enhancing and sustainable agriculture, thus addressing challenges of climate change.

Those who farm in hillside areas adopt a system of intense, permanent cultivation on the steep hills, using terraces and preventing storm drains by planting along the ridges (Gudhlang and Godwine, 2012:72; Ngambeki, Tindimubona and Mutabazi, 1999:36). This practice is environmentally friendly in the sense that it prevents soil erosion and preserves soil moisture. Farmers who have abandoned this practice to adopt modern farming tactics are faced with severe degradation of their land. Another common indigenous farming practice is known as mixed farming and intercropping or crop

diversification (Lungu, 1999:10). A good example of this practice is planting maize and pumpkins together, or maize with potatoes, or maize with beans, etc. This approach aims *inter alia* at conserving the natural nutrients of the soil through the benefit of symbiotic relationships such as of nitrogen fixation and weed control. In addition, it minimises the danger of total crop failure by spreading the risk and growing a variety of crops, while enabling the stabilisation of yields, the preservation of soil and by making it possible to harvest different crops at the same time (Gudhlang and Godwine, 2012:33).

Mixed farming may also refer to the practice of simultaneously keeping livestock and growing crops. This way of farming also helps to improve the fertility of the soil as the manure produced by livestock will be used to enrich the soil (Gudhlang and Godwine, 2012:37). Most rural Tanzanians use mixed methods in their agricultural activities.

An opposite farming method which involves monoculture, a farming practice where a single crop is planted using agrototoxic chemicals and machinery, usually in a form of plantation with high levels of social and environmental problems, is a recent invention that came with modern farming technologies. It ensures an abundance of food and maximum use of land. Besides the arrival of monoculture and other modern farming techniques, most traditional societies have intensified their farming practices and diversified crops, thus using practices that are more ecologically sound than most of the modern agricultural practices (Mwaura, 2008:16; Gudhlang and Godwine, 2012:72). Reflecting on more traditional farming practices in comparison to modern agriculture, Gudhlang and Godwine (2012:73) assert that “there are very few modern farming technologies that can rival with the capacity of these local practices in healing the worked land and conserving soil moisture and fertility.”

Another ecologically sound indigenous farming practice is known as the *Ngoro* system, originally used by indigenous people in the Mbinga district of southern Tanzania. The indigenous people in this area, known as *Matengo*, invented this method of farming for a landscape that was unusually heavily pounded with rain, destroying crops planted on the hillsides (Malley, 1999:17). These people lived in the highlands and, using their indigenous ecological knowledge, they had to develop a farming system that would protect their farmlands against erosion and that would prevent the rapid run-off of water, in order to add to the moisture of their soil while conserving soil fertility. This farming practice reveals the multipurpose functioning of indigenous knowledge in conservation

agriculture and is due to the fact that, embedded in *Ngoro* farming systems, is a knowledge of mechanisms to deal with natural disasters such as drought and floods (Mwaura, 2008:33).

Shifting cultivation is another local farming system, commonly found among African indigenous people that have to do with land use management. It boils down to the cultivating of a plot of land over a certain period and, thereafter, leaving it fallow for a few years while the farmer cultivates another field, allowing the natural rejuvenation of the first plot. This process also helps to control erosion as it allows natural vegetation to reclaim the land (Gudhlang and Godwine, 2012:37; Malley, 1999:22).

Some indigenous communities practice minimal tillage and agro-forestry to promote yields and conserve the natural environment. In areas of Tanzania where this system was commonly used, heavy bushes and forest were cleared, collected on stretches of farmland, and burned. Only those plots where collected vegetation had been burned were tilled and planted. The method is still applied by indigenous communities in the Mbinga district of Tanzania where branches of leguminous acacia trees are heaped up and burned to plant finger millet and pumpkins. The practice results in higher yields because of nutrients, released into the soil by the ash. In this process, acacia trees are not cut down in their entirety, but branches are pruned, leaving the trees to grow new branches for future use. The method represents what is referred to as agro-forestry.

In line with systems of minimal tillage and agro-forestry, some indigenous groups practice what Tanzanian agricultural studies describe as precision farming. It is an agricultural method whereby a farmer does not clear all his land but identifies parts that are perceived as being more fertile than others. In most cases these plots are those where there used to be ant-hills, cattle kraals or where household waste was collected. Only these areas are prepared and planted, with the remaining farm being left undisturbed for its continued regeneration (Gudhlang and Godwine, 2012:41).

Ujipa mound agriculture is another local ecological farming practice found in the Rukwa region of Tanzania. It involves making mounds, traditionally called *intuumba*. These mounds are mainly prepared for planting such crops as finger millet, cassava, beans and maize. Like the *Ngoro* system, this practice helps to maintain soil fertility, control soil

erosion and conserve moisture. In most cases *Ngoro* and *Intuumba* are used on farms that have been subjected to a continuous cultivation, thus serving as an alternative to help the renewal of fertility and as a technique for soil maintenance. By adopting these various practices, farmers are also avoiding the use of expensive agro-chemicals and fertilisers.

The literature also has documented *makinga maji* (water channels) that are commonly made and used by indigenous communities in the Usambara/Uruguru Mountains in Tanzania. These are areas that are prone to soil erosion, due to their physical nature. In order to prevent soil erosion and on the basis of their indigenous knowledge, groups in these areas construct water channels following the contours of the hills, to divert water to the sloping hill sides. Plants with soil retaining roots are planted to support the channels and prevent them from collapsing. These plants commonly include elephant grass and sugarcane (Gudhlang and Godwine, 2012:42).

Indigenous groups of Mwanza and Shinyanga regions near Lake Victoria in Tanzania, have since long applied *Ngitiri* agricultural methods. *Ngitiri* developed out of the need to cope with a deficiency of land for grazing, particularly during the dry season, from June to October. The system involved conserving grazing and fodder land by retaining standing hay as a reserve and allowing vegetation regeneration. Supplemented with tree planting, *Ngitiri* has proved to be effective in protecting the natural environment and improving the livelihood of the indigenous communities (Gudhlang and Godwine, 2012:43). It has helped to conserve and protect soil and to reclaim degraded areas. In this method, crop species are selected on the basis of their usefulness for sustained conservation purposes. Furthermore, traditionally, smallholder farmers adopted crops resistant to drought, short season crops, planting trees as well as changing planting dates as mechanism to adapt to climate variability (Komba and Muchapondwa, 2012:15-18).

Without being exhaustive, this section has identified some of the indigenous ecological farming practices, based on local knowledge that could potentially contribute to the promotion of an agro-moral vision, as an important aspect of ethics which, when it is well created, can potentially facilitate the apprehension and embodiment of good virtues leading to correct practices, especially in a time of climate change. To a large extent the farming practices outlined above are holistic in nature, associated with the African view of all life as being interconnected and with the belief in a respectful and careful use of

land and water resources. The picture signals an inclusive ecological community of which the members feel strongly about their involvement with the natural world. At the same time they are aware of their special responsibilities as regards non-human life (Pierotti, 2011:27-28). Climate change, currently affecting the entire earth, is a symbol of warning that certain natural environment entities that support life are beginning to diminish. Efforts are needed to reverse the situation. While Partridge (2010:412-422) says that this is a critical moral responsibility for the current generation, Williams (2010:432) urges humankind to become more conscious of the situation, to transform their attitudes and to explore all available wisdom and knowledge that may contribute towards improving the situation, especially through adhering to the agro-moral vision which enhances life-centred agriculture and minimises the adverse impact of climate change.

6.6 Indigenous ecological knowledge and an African Christian agro-moral vision

Given that the current moral-theological orientation operates within the framework of the West, as discussed in chapter five of this study, an agro-moral-theological vision that can be helpful in the current efforts to address challenges of climate change must take African realities seriously. This means that such vision must draw from the African wisdom and ecological knowledge so as to make it more effective. In relation to the Christian faith, three lessons may be drawn from these diverse indigenous ecological farming methods in the context of climate change in Africa, particularly in Tanzania and which can contribute towards developing an African Christian agro-moral-theological vision. These lessons concern the need to broaden the concepts of Christian stewardship, Christian ethics and Christian care. It means that Christian faith communities are called to move beyond a traditional understanding of these central theological themes that serve as a reminder of the critical role played by humankind on earth.

Reflecting on the traditional understanding of the place occupied by humankind in the created order, Niebuhr (1996) highlights problematic views of the nature of man [*sic*]. There is a classical view which insists on the dualism of the human being (Niebuhr, 1996:4), a Christian view that profiles the human being in the image of God, based on the anthropocentric nature of humankind (Niebuhr, 1996:13), and the modern view where the emphasis is on the human being as creature but not as image of God (Niebuhr, 1996:19). As all of these views tend to reduce the entire created order to the

humankind's personal wealth, the consequence was humankind's domination over the natural world. On broadening the understanding of Christian stewardship, Wright (1992:3) says:

Over the last few years, the concept of stewardship has changed considerably. It has become a much richer exploration of our beliefs and life style as Christians. It is not so much a means of keeping the wolf from the door of the church as an opportunity to review the whole life and ethos of the church. Its concern is for the gospel to be lived and celebrated in daily life and in corporate worship and service. It is no longer some special and separate activity... but stewardship of all resources practiced by Christians.

The author calls on Christian faith communities to understand and value all the resources that God has made available to ensure the sustainability of life on earth. Such understanding becomes important in our contemporary context where it is becoming evident how prodigal humankind has been with earth's resources. In order to regain a broader view of stewardship, O'Neill, Holland and Light (2008:1) suggest that three factors concerning the relationship between humankind and nature should be taken seriously into account:

Firstly, human beings live from the natural world. This means that humankind lives by extracting resources from the natural world. Moreover, the whole of human life and of economic production depends on the health of the natural world. In this regard, the damage and pollution that economic activities do to the natural environment threaten life of all beings on earth (O'Neill et al, 2008:1).

Secondly, humankind lives in the world in the sense that the natural environment is not merely a physical pre-condition for human life and for productive activities but, rather, it is where all species lead their lives together in mutual dependence. It means that humankind needs the environment in order to survive (O'Neill et al, 2008:2).

Thirdly, humankind lives with the natural world. The physical world existed before humankind came into being and will continue to exist after the disappearance of the human species (O'Neill et al, 2008:3). On the basis of this understanding, the Christian stewardship role comes to represent the broad and rich vision of a grateful response to

God for all of creation. It compels humankind to make responsible use of the many blessings, both material and spiritual, bestowed on the world (Wright, 1992: xiii).

Therefore, in all human activities and human interactions with the natural world, particularly in the world of agriculture, humankind has to regard and treat the earth and its resources as God's provision for the needs - not for the wants and greed - of all humankind. In this way, stewardship becomes an important principle committing the Christian faith community to a responsible custodianship of the household of God.

In addition to broadening the vision of Christian stewardship, Christian ethics in general and a Christian ethic of care in particular, also need to be re-interpreted in profound ways, going beyond a traditional understanding. Both themes are related to the transformation of people's behaviours and attitudes. Reconsideration of the themes is an urgent necessity as most of the challenges the globe is facing today, including climate change, require not only technical competence but an equally important fundamental transformation of human morals, values and attitudes. Therefore, according to Wright (1992:5), a revision of values and attitudes has to be coupled with a comprehensive Christian stewardship that deals with how humankind, through the use of His creation, relates, and becomes obedient, to God the creator. Broadly understood, Christian stewardship should challenge existing Christian ethics and transform people's approaches to resources from displaying ownership to emphasizing responsible care. A comprehensive understanding and practice of stewardship will embrace all life on earth, "enlarging the boundaries of the human community to include soil, waters, plants, and animals" (Callicott, 2004:305). The current world may have advanced science and technology at its disposal, but the challenge, posed by global warming and resulting environmental problems, calls for human society to re-consider and integrate "pre-industrial ideas of harmony with the earth into a post-industrial conception of an ecological culture" (Moltmann, 1996:101). What Moltmann terms 'pre-industrial ideas' refers to the indigenous ecological knowledge, as discussed earlier in this chapter.

In order to integrate indigenous ecological knowledge into Christian ethic of care, Moltmann (1996:101) proposes three Christian perspectives which, if critically adopted, can lead to the liberation of the earth and the enhancement of a life-centred economic system, in general, and sustainable agriculture, in particular. Firstly, there is a need to

develop a Christian cosmic spirituality. This is a necessary starting point because it affects the way that humans think about God, themselves and the entire created order. It is based on the fact that the tendency to think and believe in God, the Almighty Lord in heaven has, Moltmann (1996:100) argues, created the image of a distant God, resulting in the secularisation of the world. Creating a Christian cosmic spirituality begins with a rediscovery of the triune God. This suggests that efforts to address issues of climate change cannot be successful if the human aspect of spirituality is left out.

The idea of cosmic spirituality is based on the fact that God's creation is good and humankind, as God's image bearer, has been given a special place and responsibility in the created order (Deane-Drummond, 2014:1). Cosmic spirituality is quite important in the African context due to a number of reasons, namely African indigenous people have an inextricable link to nature, nature and culture links them to the world of super powers, a belief that all creation is sacred, and that sacred and secular are inseparable (Deane-Drummond, 2014:2). Therefore, for African communities, spirituality is the highest form of consciousness, awareness and comprehension of the universe; hence its importance in the promotion of an agro-moral-theological vision cannot be underestimated. Reflecting on the service of the poor that leads to the spiritual growth in the time of despair, Nolan (2009:37) recognised spirituality as a significant component and tool to work with in the process of transforming communities for common good.

The triune God does not exist in solitude, but in community and in a rich relationship of love and tender care. The triune God "lives with one another, for one another and in one another", supremely and perfectly (Moltmann, 1996:101). Such an understanding will shape people's thinking, attitudes and beliefs whereby it will become clear that they cannot relate to such a God through "domination and subjugation", but through community and harmonious relationships which sustain life. In such a context it becomes evident that it is not the solitary human subject, but the human being in community and in relation to others, that reflects "God's image on earth". Moreover, it is not the separate, individual parts of creation that reflect God's wisdom and his triune livingness, but the community of creation as a whole (Moltmann, 1996:102).

Moltmann emphasizes that, based on Christian understanding, "creation is a Trinitarian process where God the Father created through the Son in the Power of the Holy Spirit."

In this process the Father is seen as the preceding cause, the Son as the creative cause and the Holy Spirit as the perfecting cause (Moltmann, 1996:103). For many years the church has put a strong emphasis on the first aspect and on His transcendence, hence creating an image of a God who is removed from the creation. Rediscovering the triune God creates an image of a God who is the Immanuel (God with the entire created order), hence facilitating the inclusion of the entire creation in the reverence of the creator (Moltmann, 1996:102).

Secondly, Moltmann presents the need for a renewal of the understanding of the earth as an 'organism', as opposed to the current mechanistic and anthropocentric understanding whereby earth is viewed as the embodiment of a primitive power which needs to be subjected and dominated (1996:107). Using the Gaia language, Moltmann (1996:108) describes how this 'organism' earth functions with its own subjectivity:

- It fashions life-forms out of macro-molecules, micro-organisms and cells.
- It is in a position to keep these life-forms alive and sustainable.
- It has an inbuilt indigenous and elaborate security system which resists genetic combinations hostile to life.

This description resonates with creation stories in the book of Genesis where it is evident that God created the earth to bring forth life and nothing else. The importance of this understanding, as adopted from Gaia's hypothesis is fourfold.

1. It helps to recognise the functions of local and regional ecosystems and prevents them from being isolated and depleted.
2. It reverses classical scientific methods with their specialist nature and allows scientific discipline to cooperate with and be integrated into indigenous approaches to the search for wider connections and cohesions in the earth's systems.
3. It gives integrated knowledge a higher scientific status than scientific knowledge or indigenous knowledge would enjoy on their own, especially when such integrated knowledge no longer serves the interests of domination but is guided by a concern for a shared existence and for survival through cooperation and symbiosis.
4. It pushes the human community to put an end to an anthropocentric self-understanding and behaviour, leading women and men to fit democratically into the life of earth as a whole (Moltmann, 1996:109-110).

Thirdly, there is a need for an understanding of human beings and nature as being all in covenant with God. There is no doubt that the Christian faith entails that “God loves his creation and wants to bring its life to its full development and flowering.” This means that God, humankind and all created order are partners in this covenant whereby every form of life is unique, warranting respect regardless of its worth to humankind (Moltmann, 1996:111). In this kind of relationship, a command to “have dominion” must be interpreted anew in the light of God’s purpose and Christ’s mission, whereby it becomes clear that humankind bears a special responsibility in this covenantal relationship. By the words “have dominion” or “subdue” or “till and keep”, God is inviting humankind to participate in this mission that needs a special relationship:

1. To maintain the cosmos against the threats of chaos;
2. To keep the earth fertile and productive;
3. To aspire to perfection and liberation of the earth;
4. To affirm the interrelationship with nature, to make a commitment to honour the integrity of creation, and to learn from ecosystems and the orientation of theology and ethics to embrace the value of nature; and
5. To turn away from all idols of self-aggrandizing power which cause the earth to be dominated, plundered and destroyed (Gill, 2006:324).

Of the three proposals offered by Moltmann as the foundation for a new cosmic spirituality, the understanding of earth as an organism and the covenantal relationship of God with life in all its forms are principal pillars for the integration of African indigenous and scientific knowledge, with the aim of promoting a life-centred agriculture potentially contributing to the liberation of the earth. If people internalise these perceptions, it can potentially lead to a shift from the currently popular mechanistic worldview to a new, life-centred cosmology. This new vision will provide “a fertile soil for our [new] imaginations, opening us to new perspectives and new possibilities” (Moltmann, 1996:112).

Integrated with insights from more ancient sources of wisdom [indigenous knowledge], the emerging cosmology could furnish us with a new impetus for our struggle for integral liberation” (Hathaway and Boff, 2010:167). In the farming communities this will deepen

their relationship with the natural environment and provide a base for a new kind of ethics, grounded in care for and enhancement of life, creativity, and the beauty of the earth. Hathaway and Boff (2010:297), inspired by an ecological point of view, consider behaviour and actions as being correct if they are based on the intention to preserve the integrity, stability, and beauty of the entire ecological earth community, and as being wrong if the opposite is the case. In the long run, taking such a position will positively influence preservation of and respect for the entire community of life on earth, in relation to climate change and the world of agriculture.

6.7 Chapter summary

From the outset, the focus of this chapter was on exploring the potential of African indigenous ecological knowledge in the process of developing agro-moral vision that can result in a more sustainable agriculture in the context of climate change. It has been argued, in the first place that, in the contemporary context where agriculture performance and life in general are threatened by climate change, scientific knowledge and other forms of knowledge need to collaborate and be integrated in order to develop a comprehensive agro-moral-theological vision. Although indigenous knowledge has suffered marginalisation by Western scientific knowledge, studies have shown that the time for absolute knowledge has long passed. In today's context, integral knowledge carries more weight in addressing various challenges, including climate change and global warming, than any form of knowledge on its own.

The fact that African indigenous communities have used their local ecological knowledge to address various challenges life poses, including climate variability, confirms its potential for promoting life-enhancing agricultural practices operating under the agro-moral vision. From a theological point of view, for such knowledge integration to be possible, three theological principles need to be followed. There must be a development of a cosmic spirituality whereby people see themselves as part and parcel of nature. There needs to be a realization that, for there to be life, there has to be a natural environment. The cosmic spirituality will lead to a shift from a mechanistic understanding of earth to a more holistic view of the world as an organism. Finally, the relationship of humanity with nature should be guided by an awareness of the covenantal relationship between God, human beings and the natural world.

That humankind is made in the image of God becomes evident, not by humankind positioning itself above all other life, but by maintaining a harmonious relationship with God, fellow human beings, and all of creation. These three concepts have the potential of deepening an understanding, especially in the agricultural societies, of nature and of the forces of life embedded in it. This can potentially lead to the respect and care for the entire community of life and hence, to the adoption of life-centred agricultural methods.

On the whole, the creation of cosmic spirituality, understanding the earth as organism, and the re-development of the covenantal relationship with nature will also result in the transformation of people's attitudes, behaviours and worldviews, hence enhancing their moral responsibility and care for God's creation, particularly in the world of agriculture. Such a transformation does not happen overnight, rather it is a process which requires a high level of the Christian faith community's commitment as it participates in God's mission. It is for this reason that the next chapter is devoted to an exploration of ways in which an African Christian ethic of care can be cultivated to transform people's attitudes towards God's creation from an irresponsible and anthropocentric position to an acceptance of moral responsibility, *inter alia* by dealing with climate change through advocating and promoting sustainable agriculture.

CHAPTER SEVEN

CULTIVATING AN AFRICAN CHRISTIAN ETHIC OF CARE FOR SUSTAINABLE AGRICULTURE IN THE CONTEXT OF CLIMATE CHANGE

But whoever joined with all the living has hope

Ecclesiastes 9:14

7.1 Introduction

The preceding chapters have addressed the research question of this study, *in what ways can an African Christian ethic of care be cultivated to enhance sustainable agriculture in the context of climate change in Tanzania?*, in a myriad of ways. While the first chapter introduced the study as whole, the second chapter set a base of discussion by exhibiting that agriculture is a dominant economic activity in Tanzania, climate change is real and that there is little regards given to the natural environment. Chapter three has further demonstrated that climate change and agriculture are intrinsically linked. While the former affect the latter, the latter also affect the former in various ways. This means that unsustainable agricultural methods affect the natural environment, thus contributing to climate change and climate change in return affects the performance of agriculture. Chapter four argued for the link between climate change, agriculture and theological discourse. On one hand, it has demonstrated that theological reflections have significantly contributed to the problem of climate change by influencing a human anthropocentric attitude towards God's created order. On the other hand, the chapter went on to articulate that embedded in theological discourse are useful resources that can contribute to the solution to the problem of climate change and promote sustainable agriculture. Chapter five has presented some insights on the need for a Christian agro-moral-theological vision as a theological response to the issue of climate change in the world of agriculture. This is because climate change does not only constitute technical know-how, but also has ethical aspects that cannot be underestimated. It was argued in chapter five that such an agro-moral-theological vision must be rooted in the African soil. On this basis, chapter six highlighted the potential of African indigenous ecological knowledge in enhancing an agro-moral vision and promoting sustainable agriculture, especially when integrated into

scientific knowledge. Therefore, chapter seven draws together all the strands of this study and present potential options for cultivating an African Christian ethic of care in the world of agriculture in response to the current climatic crisis. The chapter begins by describing the concept of care while pointing out the essence of saving the soil followed by discussion on creation care as new mission frontier. Then the chapter continues to highlight the potential of African Christian formation in order to cultivate an African Christian ethic of care to enhance sustainable agricultural methods that are life-affirming, thus addressing challenges of climate change.

7.2 Conceptualising ethics of care

Held (2006:32) describes care as “an attitude and an ideal which manifests in activities of care in the concrete situation.” Also “Care is an activity that includes everything we do to maintain, continue and repair our world so that we can live in it as well...” In both descriptions, it becomes obvious that an ethic of care “builds relationships of care, concern and mutual response to needs on both personal and wider society levels” (2006:43). The central feature of an ethic of care is its desire to attend to and meet the needs of others for whom one is responsible. It also recognises that human beings are dependent on others in many ways hence responsibility and care are intertwined.

The ingredients of care include issues such as attentiveness, trust, responsiveness to needs, and cultivation of mutual relationships. In the ethic of care the interests of the two parties, i.e. the carer and the cared for are critically intertwined rather than simply competing with each other. The priority of care evolves based on values such as trust, solidarity, mutual concern and empathetic response. It is these values that govern practice of care where relationships are cultivated, needs are attended to and sensitivity is clearly demonstrated (Held, 2006:16).

Literature has shown that care (Held, 2006:16; Boff, 2008:56), when looked at it from a practical point of view, is a fundamental value that governs people’s lives, practices and relations. Although some critiques would emphasise issues of justice as the key to human life, it is still evident that care leads the way. Care has persisted even where there is no justice. Emphasising this point further, Held (2006:17) continues to say;

There can be care without justice: there has historically been little justice in the family, for example, but care and life have gone on without it. There can be no justice without care, however, for without care no child would survive and there would be no person to respect.

Opponents of ethics of care views it as a mere family ethics, but most of its advocates argue that the ethics of care has far reaching social and political implications which need to be uncovered in order to harness its richness, thus becoming a radical ethics which calls for a profound restructuring of the society. Having this in mind, Boff (2008:59) admits “care is a permanent companion of human being.” Moreover, in order for this ethics of care to be of great value to the wider society, it must envision caring “not as practiced under male domination, but as it should be practiced in post-patriarchal society” (Held, 2006:19).

7.3 Emergence of ethics of care

The emergence of the ethics of care is linked with the feminist thoughts and movement of rethinking nearly all fields of inquiry that started in USA and Europe in the late 1960s (Held, 2006:22). This is a period when issues concerning the status of women in the society and knowledge became the focus of the day. The claim that the experiences of women are as important, relevant and philosophically interesting as the experiences of men became the ground for its emergence. Experience of women was the central focus of the feminist movement (Held, 2006:23). The end result of this feminist movement has had a significant and important impact in various fields including the field of ethics.

The movement brought to the surface a fundamental critique of the dominant moral theories and developed an alternative feminist approach to moral issues. It was argued that the dominant moral theories were formulated based on the experiences of men and are therefore inadequately morally relevant because women’s experiences are excluded. Issues such as relationships, responsiveness, friendships, affectionate responses to needs, which constitutes largely women’s experiences and which seem to provide better moral guidance, were missing in the dominant moral theories (Held, 2006:24).

In this regard, an ethic of care emerged as one of the most distinctive alternatives to a moral approach. An ethic of care is seen as containing a different set of values that are

potentially more adequate in the treatment of moral issues, not only at a personal and family level but also at the level of wider society as well. Therefore, ethic of care emerged as a critical challenge to other moral theories. From the feminist perspective, it takes the experience of women in caring activities. Mothering is taken to be an example to interpret and emphasise the value inherent in caring practices.

In this way, ethics of care pinpoints the inadequacies of the traditional moral theories and then extends insights embedded in it to other moral issues. It is therefore worth pointing out that the emergence of an ethic of care is championed by the concept of mothering, whose purpose is to preserve life and foster growth of an individual into an acceptable citizen (Held, 2006:26). This means that women's relational experiences with life-enriching capacity can be enjoyed by both men and women, especially if shared equally. Since theory of an ethic of care emerged from the lived experience of women through their mothering activities, it has the potential to attend to moral issues, unlike traditional moral theories which are based on the abstract. Therefore, caring is a metaphor that carries potentials of ensuring that in all that human beings do in this world, the driving force must be about protecting, respecting, honouring and preserving life, all said in one word 'care'.

Boff (2008:59) sees the concept of care as the most encompassing one, for it explains the way human beings should exist and co-exist. Moreover it is described as, "the way of being present, of navigating through reality and of relating to all things in the world [created order]." Noddings (2002:11) insists further, "Caring is basic in human life and not something regarded as an added attraction - that indeed all people want to be cared for." Naturally, ethics of care can be described as a dutiful form of caring attitude which reverses the Kantian ethical theory, placing priority on personal commitment to be a caring person and community commitment to be a caring community. The aim in the caring process is to offer a positive response and prevent harm both from outside and from people themselves (Noddings, 2002:30).

Although the notion of care as ethical theory emerged as a result of feminist struggle against patriarchal domination in all sectors of life, observed from a Christian perspective, it is a God-given human vocation. Boff (2008:14) is correct when he [*sic*] concedes that caring is the *ethos* of human beings. It means that care is part of human

nature and it is what defines humanity. In other words, it is a God-gifted nature that everyone has, but circumstances tend to corrupt such nature. Within God's creation there is a life giving force for both human and nonhuman creatures. God could have not commissioned human beings to take care of the earth if he had not created in them this caring capacity. It is a way of maintaining human relationship to nature with all of natural resources in it. It is on this ground that Hooks (2010:368) argues that modern human beings have tended to be unmindful of their history of living in harmony with the created order; hence they do not see the value of taking responsible care of the natural environment that has life-enhancing capacity. When God commissioned human beings to be responsible carers of the earth, He [*sic*] was mindful of the fact that caring and safeguarding integrity of creation equals caring and safeguarding one's own life because it is through caring for creation that humankind's own well-being is ensured.

Since the magnitude of climate change signifies human carelessness for God's creation, especially in the world of agriculture, it also serves as a reminder that the time has come where there is a need to "review our relationship to the earth" by reviving the natural caring which is a human inbuilt element (Hooks, 2010:368). There is a Tanzanian expression which says 'do not cut down the tree that has sheltered you during the sunny day.' Interpreted ecologically, this expression means that caring or not caring for the earth has a significant effect on one's own life individually, as well as collectively. For this reason Taylor (2010:381) offers the reminder:

We belong to the earth. The earth is our home, our place in the universe... the only place we know for sure that living things exist. While there may be life elsewhere, we know that complex life depends on the conditions so uncommon, and the universe; indeed, earth may be the only place such life exists.

This calls for the need to recover the current situation by restoring the human-earth harmonious relationship. Human beings must live on this planet in a mutually enhancing manner, viewing the earth in the depth of their own being and fully participating in enhancing its life-supporting capacity. In order to restore a natural caring and harmonious human–earth relationship, Rhoads (2010:3) has suggested two approaches. The first approach is to revisit a mistakably inherited concept of creation. The three mistakably conceptions of creation are:

- Reading the Bible in ways that disregard, disrespect and degrade the rest of creation;
- Irresponsibly placing humankind above the creation and ascribing on human authority to dominate nature for human consumption; and
- Perceiving humankind as pilgrims on earth and that their home is in heaven.

The implication of these conceptions is that they make people, at least for the sake of this study, farmers, to plunder the earth with the mentality that they have a God-given mandate to do so and that physical world is not as important as spiritual affairs. Snyder (2005:6) concurs with Rhoads (2010:4) conceding that such inherited tradition has created a considerable barrier that has prevented human beings to take up their caring responsibility for the natural created order. This makes the present crisis as result of negative attitudes of human beings on the earth that have been long nurtured by such misconceptions of the scripture.

Secondly, the transformation of this attitude should involve a new understanding and recognition of the value of God's good creation. This includes understanding of some biblical facts that affirms the opposite of the traditional understanding. Among such biblical facts has to do with knowing that human beings belong to the earth and that creation was not formed for human beings alone. Moreover, it should be understood that God seeks to ensure that all creation thrives, whereas human beings have a particular responsibility to care for the earth. Also it has to be known that justice for human beings is related to justice towards the earth and that Jesus Christ died for the sake of the entire groaning creation in order to reconcile it with Almighty God the creator.

According to Snyder (2005:19), all these present a rich biblical heritage which has been neglected for so many years. This biblical richness implies that earth is considered as God's habitation and has been entrusted to humankind for its care and well-being. Snyder (2005:20) continues to identify five reasons why God entrusted care of the earth to human beings. The first reason is that creation care is important for God's own sake because a healthy creation reflects the glory of God. Therefore, caring for God's creation serves as a fundamental way of glorifying God.

The second reason is that creation care is necessary for humankind's sake. This is based on the fact that human life cannot be sustained without a healthy creation. Therefore, a healthy creation is good for human well-being (Snyder, 2005:24). The third reason is that creation care is of critical importance for creation itself. This is because both human and nonhuman creation constituents have a God-given right to exist and flourish, regardless of their relationship to humankind. Fourthly, creation care is good for mission because God is in mission on which the church is invited to participate. Therefore, if God loves the world, the church has no option (Snyder, 2005:28). Finally, creation care is critical for the sake of the future generations (Snyder, 2005:31).

In the light of Snyder's formulation reflected above, argues Feldman and Moseley (2003:227), this is likely to result in a spiritual formation where Christian based environmental care will recognise the interconnection between faith, morality and environmental issues. Realising such interconnections, it becomes necessary and possible for faith communities to contribute to promoting transformation of values, attitude and conduct, all of which support an ethic of care for God's creation.

This, in the whole, amounts to a "new paradigm" that allows them to see the causes of environmental problems and search for ways to alleviate them. This will eventually go against the traditional worldview which tends to separate humans from the rest of creation, thus leading to the new paradigm based on the vision of an earth-caring community. It is this new vision, which emphasises theocentric worldview, which will potentially influence "commitment to life and recognition of both the complexity of the ecosystems and limits of human reasons to overcome natural constraint" (Feldman and Moseley, 2003:228). This is an important strategy which calls for recognition of the interdependence of spiritual, physical and environmental well-being in line with issues of peace and justice. More importantly, this new vision serves as spiritual motivation and support for the community to transform their attitudes and lifestyle.

Furthermore, the vision for an earth-caring community is also likely to deal with the corruption or illness of the term 'stewardship', just as it is for the term 'sustainability' in the secular sphere, when used in the context of environmental issues. This would differentiate Christian stewardship environmentalism from that of secular environmentalism. Responsible stewardship is largely "set in a distinct Christian

perspective, justified by the Bible and Christian theology, intertwined with image of Christ and creation...of reformation and of God's calling to stewardship..." (Feldman and Moseley, 2003:234). This means that with the vision of an earth-caring community, Christians can potentially begin to reclaim and develop the distinctly biblical concept of stewardship.

In this way ecological conversion is being promoted, leading people to become more cognisant of the appropriation that the earth belongs to God and human beings are called to be stewards of creation as a whole. They should hence seek to be responsible to the God-given mandate to responsibly protect, nurture and cherish the gift of God's creation (Feldman and Moseley, 2003:235). Since earth-caring Christian communities draw their values from the scripture and their own indigenous traditions, they could contribute some unique assets that could collaborate with secular assets to address the environmental and climate change crisis today, in relation to the world of agriculture.

An earth-caring community believes that addressing environmental problems today does not only require coercive strategies, as deemed necessary in the debates on climate change and environmental problems. Rather, unconventional approaches such as spiritual formation and transformation have the potential of influencing "self-consciousness on how humans view their relationship to nature and to one another in a mutually beneficial way" (Feldman and Moseley, 2003:248). Christian faith communities are then encouraged to envision various ways of making sure that various aspects of natural environment are well taken care of, as is highlighted in the following sections.

7.4 Saving the soil: Responsible care through life-enhancing agriculture

As discussed in chapter six of this study, in order for an African Christian ethic of care for the earth to be properly cultivated to promote sustainable agriculture, there is a need to transform human attitudes towards the rest of creation. This is the case because the current dominant attitude is anthropocentric and has been nurtured for many years, allowing it to become entrenched. Saving the soil does not mean returning to subsistence farming, but rather seeks to portray the significance of recovering a sense of human belonging to the entire universe. It is a reminder to the human being to re-learn to

“reconnect with ecological and social contexts that ensures their sustainability” (Wirzba, 2003:7).

Moreover, in order for reconnecting to ecological and social context to bear fruit, it is also important to develop a complete view which attends to the origin, purpose and goal of [human] existence (Wirzba, 2003:12). This means that it is not enough to simply gain knowledge about human interconnectedness with the natural world. A true change can potentially happen only when “we know how to live out our interdependence responsibly and in a context of what all living is the final for” (Wirzba, 2003:12).

Arguing in this regard, Hathaway and Boff (2010:65) concede that for many years an anthropocentric worldview has kept humankind separate from the rest of creation. It is this anthropocentric attitude which stands at the heart of today’s economic system under which unsustainable agriculture is practiced in various parts of the world, with no exception in Tanzania. For that matter, human societies are well influenced by the anthropocentric view of creation in such a way that the choices they make on how to relate to the created order harms the earth’s life systems (Chapin, 2010:75).

According to Collin (2010:82) any continued separatedness is likely to lead humankind and the entire earth into a more serious illness. On this basis, time is long overdue when humankind needs to restore reverence to God’s creation because climate change and its impact is a sign that harming the created order equals harming oneself. Collin (2010:86) affirms this further stating, “We are the people of the earth. We do not own her, we belong to her. What she experiences we experience. We dream her dreams. We cannot do things to her without doing them to ourselves.” In this way there is no doubt that the created order is what defines humanity, hence caring for it is healthy and sane.

Van Niekerk (2005:5) points out that changing human attitude towards the rest of creation cannot be achieved by technical fixes, but only through mind-set shifts. Further, argues Prozesky (2005:16), at the present time where human-induced climate change has inflicted much of the suffering, the mission of Christians is not only to save souls as it is traditionally understood, but also saving the soil (earth). This means that Christian farming communities need to be equipped so that they are able to spread a message that the world’s soils are in danger of being eternally lost and thus need to be saved.

The importance of such message is based on the fact that the earth has been imperilled because of the human activities that are harmful to nature and which adversely affect all myriad forms of biological life that constitute the ecological systems of the planet. More importantly, modern methods of cultivation have caused severe contamination of the soil, hence combating climate change and global warming calls for saving the soil (Martinussen, 2004:141). This is mainly because, argues Nestle (2010:183, 1840) and McMahon (2013:77-84), such farming practices have left behind a huge amount of toxicity that disrupts the soil ecology. In this regard, it is highly recognized that Christian faith communities, like any other communities of faith, can play a significant role in transforming anthropocentrism to a more holistic attitude towards the created order. Religion is capable of reminding its members about traditions which guide their attitudes, thoughts and actions in everyday life. This is of great importance because the earth constitutes a variety of life which needs to be protected and cared for.

According to O'Brien (2010:25) caring for biodiversity (variety of life on earth) is not supposed to be the interest of scientists alone. Given that the focus is to care for and protect life, caring for biodiversity becomes a religious and theological concern. This is the case because of two reasons. First, biodiversity is part and parcel of God's creation and a better means to understand God's providence. Second, God is God of life and his purpose is to preserve, protect and sustain a dignified life in all its forms. It is on this basis, it was argued in chapter six, that in order to transform human attitudes towards God's entire creation and eventually cultivate an ethic of care in the world of agriculture, the following must be taken into account: re-developing Christian cosmic spirituality based on the rediscovering of the triune God; renewal of the understanding of the earth as organism; and re-envisioning covenantal relationship between human, creation and God. Once this has been achieved, God's creation care can be potentially realised.

However, argues Campbell (2010:146), the current dominant model that has for many years guided human relations to nature has to be revisited. This model is the one that historically and principally has promoted human beings as "authoritative lords and viceroys" of the earth. There are both moral-theological and scientific reasons for this model to be either revisited or discarded. From a theological and ethical point of view, this model has for so long cultivated "deadly vices of pride, greediness, and materialism

thus fostering an attitude of separateness from earth and corresponding practices of attempted dominion and mastery over nature.” Moreover, such a model has encouraged the perspective that natural resources are to be accumulated and consumed “in service to the purposes of human viceroy” (Campbell, 2010:146). In the whole this is contrary to the biblical teaching and “imperatives of care for the stranger, the vulnerable and voiceless” including the created order (Campbell, 2010:147).

From a scientific point of view, this model has been proven to be inaccurate and lacks the necessary balance between human and nature. This is because human beings depend on various life-forms embedded in the ecosystem for their biological existence and sustenance. Therefore, “awareness of biological reality that our very existence is contingent on earth, soil, water, air etc. should cultivate moral dispositions of gratitude, humility and solidarity” (Campbell, 2010:148).

Reflecting further on the creation stories, Campbell (2010:149) insists that caring for creation is a God-given mandate and an obligation of humankind. The fact that after each stage of creation and when the entire creation process was complete, God looked at whatever He had made and commended that everything was good, shows that God recognised the value in the created order. This is an indicator that in order for human beings to take care of the earth, they must first and foremost “envision its intrinsic goodness, its fragile and intricate life-supporting ecosystems, and the mysteries by which life manifests itself” (Campbell, 2010:150). This sets a foundation for Christian ecological mission which is holistic and which gives glory to God the Creator, ensuring human well-being and enhancing the well-being of nonhuman creatures. Also it sets the basis for maintaining the interdependent nature of life on earth, making church participation in God’s mission more effective for today’s world and finally ensuring the needs of the future generation (Snyder, 2005b:236). As a result of this, integrity of creation is safeguarded.

According to Moltmann (1997:23) ecological mission respects the integrity of the created order and eventually restores the life affirming relationship between human societies and the natural environment that has been long destroyed due to unsustainable uses of technological achievement, especially in the agricultural sector. Such relationship will be based on the wider understanding that human’s physical existence is “linked to all senses

of natural world on which it is dependent” (Moltmann, 1996:260). Not only that, but also due to the fact that human life is entirely a participant in nature.

Explaining this further in a more compelling way, Schaefer (2009:4) argues that respecting integrity of creation based on its goodness, beauty and sacramentality will stimulate human thinking and desire to apply such knowledge and respond to the current climatic changes and environmental problems. The intrinsic value or goodness of creation has its origin in God the Creator who empowers evolutionary processes from which all creation entities emerge. This leads people into appreciating the beauty of creation. The implication of this is that the way that the church understands and does mission need to be redefined.

Reflecting on the church’s understanding of mission, Bookless (2008:96) argues that the history of the church mission has committed three grave mistakes in terms of its theology and praxis. Firstly, traditionally the church has underplayed the diversity of mission involvement and narrowly focused largely on saving the souls of humankind. Secondly, mission history has also downplayed the contribution or the role of indigenous Christians towards God’s mission on earth. This means that in the process of church mission, “the local knowledge of habitats, ecosystems and soil types” which was not destructive to natural environment was highly disregarded. It is for this reason that Selvamony (2010:137) argues that because of the ever growing industrial society and its rational worldview, even the mythology that existed among the indigenous people was ignored hence lost its hold over people.

Thirdly, the mission of the church excluded the non-human created and deficiently emphasised God’s mission for humanity only. Very rare emphasis was made to acknowledge Gen 1:26-28 as the “first great commission”, calling humankind to be God’s representatives and responsible stewards in serving and preserving nonhuman creation. In concurrence with Bookless (2008), O’Conaire (2008:25) adds that safeguarding God’s creation has been almost nearly completely absent in the mission of the church, such as in the catechism classes, preaching and even theological reflections. This is an indicator of how safeguarding integrity of creation has been underplayed in the history of mission. This, therefore, suggests that for centuries creation care has not been recognised as a necessary component of the mission of the church which is grounded in

the *missio Dei* to the entire created order. For this reason, cultivating an African Christian ethic of care in the agricultural sector in response to climate change and environmental degradation is a mission concern for the care of God's creation, as discussed in the following section.

7.5 Creation care and agriculture: A new mission frontier

As has been alluded to in section four of this chapter, biodiversity can be theologically described as the variety of life forms within the created order. In the light of this, Jesus summed up the central tenet of Christian mission in John 10:10 where the emphasis is to ensure authentic and dignified life for all. Human induced climate change due to unsustainable treatment of the natural environment, with unsustainable agricultural methods being a good example of such treatment, presents critical challenges to the church in the 21st century to advocate for dignified life that encompasses the whole creation. This means that the church cannot continue unconcerned with the “current destructive economic model of development which is responsible for irrational exploitation of natural resources” (O’Conaire, 2008:22).

In other words, the church is being re-called to advocate for an alternative development model which is more life-affirming, especially in the world of agriculture. This is a call not to neglect the traditional mission, but to chart a new terrain of missionary work which embraces saving the soil (earth). It means that Christian faith communities have additional responsibilities to offer an appropriate witness as they seek to participate in God's mission for the world. This means that, contends IRCPT (2012:12), “religious teachings should guide on how to protect the environment as part of God's Creation. [This is important because] human beings have a unique role concerning what is happening to our environment and therefore, our practices have to be guided by ethical consideration as opposed to economic gains alone.” With regard to agriculture which has a significant contribution to the climate change and environmental degradation, Christian farmers are called “to be prophetic in the way they live” and the way they practice their agricultural activities, thus “responding to the signs of time, such as climate change” (O’Conaire, 2008:22).

In order to equip these Christian farmers to be able to adopt life-centred farming practices, the church, as a mentor of Christians, needs to take climate change and environmental degradation as avenues for Christian mission. In this sense, the church needs to re-define the “implication of the gospel mission” of Christ to bring a dignified life to the world (O’Conaire, 2008:23). The importance of this is based on the fact that the absences of health and unsustainable ecosystems have a great contribution towards undignified life. Therefore, it makes logical sense for the church to promote the dignity of human life by also promoting a health ecosystem and sustainable agriculture. This will forge a shift of focus from a human-centred attitude to a more holistic way of understanding the place of humankind in the entire created order conceived as a living organism. Moreover, it is particularly important to the farmers who are in constant active interaction with the natural environment. It is clear from the literature that although the natural environment works largely unseen, it “provides an incredible amount of services to the living world as a whole” (O’Conaire, 2008:24). Examples would be the fact that there is no plant or crop that will flourish without healthy soil or that halving the number of plant species on the farm is likely to lead to 10-20% loss of productivity (O’Conaire, 2008:25). This means that any quality living for which humankind is striving is linked to the quality of the biodiversity as a whole.

7.6 Eco-Mission as creation care

As discussed in section five of this chapter, in the context of climate change, caring for God’s creation through sustainable agriculture is a new mission avenue. Although an appeal to *missio Dei* has dominated mission literature for centuries now, Christian mission is still largely ecclesial-centric and anthropocentric while sidelining nonhuman creation as a necessary part of mission. In this regard, Bosch (1996) contends that such sidelining is partially due to the 20th century context in which the concept of *missio Dei* was conceived. The concept of *missio Dei* was conceived in the context of advancement in science and technology and subjugation of the marginalised countries by the colonial powers.

The context was shaped further by ever growing economic inequalities and development of local theology that created a significant challenge to the modern mission praxis, leading to a paradigm shift from ecclesial-centric to theocentric mission – *missio Dei* (Bosch, 1996). This suggests that the ongoing crisis of climate change and environmental

degradation calls for a paradigm shift focussing on Christian ecological mission which seeks to address human caring responsibility towards creation, fellow human beings and the future generation of life. This is contrary to the dominant emphasis of mission placed on humanity *-Imago Dei-* as the sole focus of *missio Dei*, thus underplaying the value of God's creation (Kaoma, 2010:1-2). In this situation, the whole idea of the mission of the Creator God brings to the surface the good news of liberation to the entire creation.

Adopting Christian ecological mission as expression of the holistic mission of God, especially in the light of sustainable agriculture, provides an opportunity for Christian farmers to consider safeguarding the integrity of creation as a way of witnessing to God/Christ (Kaoma, 2010:3). This is the case because in the context of climate change and environmental disintegrity, witnessing to Christ remains incomplete without responding to environmental problems and cultivating human responsibility to care for God's creation for now and for future generation. Kaoma (2010:4) continues further to assert, "the instrumental view of natural world which dominated early missionary activities and which still influences our economic theories today" should be replaced with a holistic approach to mission which honours the interconnectedness of the whole created order.

The fact that "mission of God cannot be separated from the reign of God" makes ecological injustices today to be matters of critical importance to the mission of the church. In the celebration of the global mission centenary (Edinburgh 1910-2010), it was evident that any mission activity beyond 2010 can never be able to advocate for "justice, love and peace" for the world if no effort is taking place to safeguard the integrity of creation (Kaoma, 2010:5). In this regard, Biehl (2009:113) is correct when insisting that the whole idea of development should be perceived as transformation and expression of the mission of the church, and part of its witness in word and deeds, founded in the theology of life which has its basis on the biblical promises of life abundance.

The emphasis on ecological mission as mission of creator God is likely to create, within humankind, an understanding of the origin of creation, hence leading to the Christian ecological mission. The notion of ecological mission is quite acceptable in African societies in general, and Tanzania in particular, because traditionally indigenous people view the whole creation as the "most pure expression of God's power" (Kaoma, 2010:6).

This understanding is, more often than not, coupled with the belief that the Supreme Being (God) and ancestors do reside in various creation constituents, hence they are perceived as the central and key guardians of the earth as a whole.

It is widely acknowledged among the indigenous people in Tanzania, for example, that whereas human beings are entitled to the use of the natural environment for their own well-being, they are also responsible for and have a moral obligation to hand over the earth to the future generation with its integrity intact. In this regard, any mistreatment of the earth and its natural resources simply means an attack on the ancestors which may extend to the Supreme Being (God). This is a significant ecological implication of the acceptance of Jesus Christ as an ancestor among the African theologians (Kaoma, 2010:7).

According to Snyder (2005a:4) Christians have a God-given responsibility to “care for the garden.” Apart from this first great commission, God has continued to work toward redeeming and transforming creation thus invites church to participate in such divine mission. The process through which God redeems and transforms his creation can be summarised as follows:

- God is the owner of the universe for He [*sic*] created it; therefore, humankind has no right to mistreat it but to be responsible steward over it.
- Because of the complex spiritual-physical-moral-ecological disorder that damages the universe due to human’s sinful nature, God decided to reconcile the entire creation to himself through Christ- God is bringing transformation and re-creation through Christ.
- God has given the church the mission for this world and the world to come.
- All Christians are called to live in harmony with biblical principles of justice, mercy and responsibility (Snyder, 2005a:3).

In the light of such God’s mission praxis, “the current worsening ecological crisis demands [among others] a missiological response... which springs from spiritual mandate to heal, liberate and care for the earth after the pattern of the loving creator” through various economic performances, thus creating a space for cultivating an ethic of care to promote sustainable agriculture (Kaoma, 2010:8).

7.7 Cultivating African Christian ethics of care for sustainable agriculture

Agriculture, though it has not received much theological reflection in the modern time, is one of the God-given vocations for human beings, at least in the biblical perspective. There are many references throughout the scripture that refer to agriculture. Almost all major festivals celebrated in the Hebrew society were linked to celebrating God's gifts of rain and crop production (Tischler, 2006:8). It is also evident in the New Testament that Jesus lived in a farm country; he passed through farms as he navigated the countryside with his disciples. His parable makes great reference to agriculture such as "tilling the soil, dealing with rocky ground and weeds, cutting down an unproductive fig tree" (Tischler, 2006:9). In line with Tischler, Davis (2009a:8) states; "Beginning with the first chapter of Genesis, there is no extensive exploration of the relationship between God and humanity that does not factor in the land and its fertility into that relationship." It is on the basis of this intricate relationship that God commissioned humankind to till and keep the earth, which suggests a life-affirming type of agriculture. Saving the soil, creation care and eco-mission, as discussed above, calls for life-affirmation as one of the critical aspects of the Christian faith and mission, which, if taken seriously, will likely forge the formation of the earth-caring community, keeping them well informed of the responsible care of God's entire created order. In the context of climate change, therefore, the formation of such community must be preceded by the understanding that sustainable agriculture is a Christian concern, mission concern, a pastoral issue as well as African Christian ethic of care as will be discussed below.

7.7.1 Sustainable agriculture: A Christian faith concern

The first article of the Christian faith confession of the Apostles Creed which begins by stating '*I believe in God the Father Almighty, the Maker of Heaven and Earth*' (Tappert, 1981:18), suggests that the foundation of Christian faith is the belief in God as Creator of the universe. This statement of Christian faith is a brief summary which describes "God, his nature, his will and his work" (Tappert, 1981:411). For Christians, this means that everything they see and every blessing that comes their way must remind them of the nature of God and his will for the entire world. However, argues Largen (2009):

Since the rejection of marcionite theology early in the church's life, Christians have consistently affirmed that God of salvation is also a God of creation...This

affirmation begins with a Christian belief that God is the creator of all. Christians take this statement [of faith] for granted and typically do not give it much thought (Largen, 2009: 127).

For Christians, the statement that God is the creator of earth and heaven contains two theological implications embedded in this declaration of faith. The first one is about a kind of love that God has for the entire creation and the second one is about the ongoing creative activity of God. The two theological implications affirm “God’s continued participation and presence within the created order” (Largen, 2009:127-128).

The fact that climate change is the result of humans mistreating God’s created order, suggests that human beings in general and Christian faith communities in particular have failed to live up to the faith they confess. In this way climate change shakes the fundamentals of Christian faith, hence making it to be a matter of Christian faith. The Christian confession is based on the creation stories recorded in the book of Genesis where God is portrayed as creator of the world and approves whatever he created to be delightful (Moberly, 2009:1). Despite various interpretations and understandings of the book of Genesis, what stands out for Christian communities is that Genesis is a book of faith and life (Moberly, 2009:12). In the book of Genesis, God does not only create the world, but equally importantly, also offers instructions regarding his creation. Humankind, of all creatures, is gifted with responsibility over the created order which denotes a kind of relationship that needs to exist between the rest of creation, God and humankind.

According to McMullan (2010:11) God’s ability to create life on earth from nothing is one of a distinctive belief of the Christian faith from its inception. In addition, Soskice (2010:24) insists that the teachings of God as creator and source of life is central in Christian tradition, which means that at the heart of this doctrine is the dependence of all things in God and “God’s free choice to create and sustain the world.” Therefore, the first article of Christian faith confession i.e. Apostolic Creed, explains the essence, will, activity and work of God on earth (McMullan, 2010:25).

It explains the fact that God did not only give humankind what they have around them, but rather it is the same God who preserves and defends his people against all evils out of his pure love (Luther, nd:55-56). This description explains that God’s creation is not a

one-time event but a continuous relationship of ontological dependence. For this reason, nothing created exists on its own. Everything, with all its properties, is immediately sustained and conserved by God. Furthermore, God's creation is an expression of divine generosity (Tracy, 2010:221-222). Therefore, by confessing faith in God the creator of earth and heaven, Christians declare their recognition, belief and commitment to the following truths about the earth:

First, Christians acknowledge the truth that the earth and its resources are part of God's good creation. The implication is that since the earth is God's handiwork, the appropriate treatment should be that of care and concern for it, reverence, and respect of it, without any attempt to elevate it to the same level as God (Gnanakam, 1999:32).

Second, through the same confession, Christians declare and recognise God's revelation to his people who belong to a particular location (their own context) through the planet earth and all that is in it. This is the case given the fact that it is evident from the scripture that "God is committed to revealing himself to people" using the entire created order (Gnanakam, 1999:33).

Third, by confessing God the creator of heaven and earth, Christians admit the truth that God is concerned for the well-being of the earth, thus there is a continued sustaining relationship with God and his created order. Such positive relationship exists even between human beings and the rest of creation based on the fact that God made them from the earth, hence the substantial sense of belonging to the earth. The covenant of God with Noah reveals God's desire or intention to maintain his relationship with the entire created order. Such a covenant which embraces the earth and human society presents the ecological relationship that exists between God, his creation and both human and nonhuman creatures.

In the whole, the Christian confession of faith in this article offers a sufficient biblical and faith justification on the importance of the earth not only to God, but also to humankind, thus grounds for promoting life-enhancing agriculture. This planet, unlike any of the other planets, has the capacity and God-given ability to create, re-create, produce and sustain life through natural resources and natural environment. However,

such capacity has been depleted by humankind's unsustainable treatment of the earth, the result of which is a degraded environment and adverse climate variability.

To reverse this situation and to transform human attitude with regard to the created order, proposes Gnanakam (1999:40), the whole mission programme needs to start with creation, as it is in the Christian faith confession. The problem has been that, although the Christian faith confession begins with acknowledging God as Creator of the universe, to a larger extent the mission of the church has been focussing on the redemption from the fall, as it is recorded in Gen. 3 (Gnanakam (1999:41).

When mission of the church begins this way, it limits God's work to humankind alone (Gnanakam, 1999:41). Starting with the theology of creation, as the Christian faith confession suggests, means that God's mission becomes an all embracing mission. Sometimes speaking of holistic mission has not involved the whole. Starting with creation allows the church and humankind to capture the scope of its completeness.

This calls for widening the understanding of God's mission to include the whole creation based on the fact that it is the key principle of Christian faith. This has the potential of enhancing the belief that "God created the world and continues to be the Lord of his creation. As result of this, there will be a strong motif which allows people to get involved effectively in being God's agents to treat environment in a more sustainable manner" (Gnanakam, 1999:41). According to Fick (2008:21-22) sustainable treatment of nature restores the three key principles of biblical stewardship; one, the earth is the Lord's. Two, the Lord's earth is placed in the care of humankind and three; stewards are responsible for the service, cultivation, and protection and care that they render.

7.7.2 Sustainable agriculture: A mission concern

In chapter three of the this study, it was argued that due to unsustainable farming methods, the agricultural sector is the second main contributor to climate change and environmental degradation, hence becoming one of the life-denying sectors. Since the central mission of Christ and the church is to save life, when unsustainable farming methods threaten life then it becomes an issue of mission concern. It means that mission

of the church cannot attain its goal if it does not labour to advocate for life-enhancing farming methods.

Emphasising that climate change and environmental crisis is a mission issue, Ayre (2008b:2) uses the term eco-mission theology to describe a type of mission that works in the light of ecotheology to serve and heal the planet earth. For Ayre, eco-mission is supposed to be a third phase of mission in the world, based on the history of mission. Whereas the first phase of mission focused largely on evangelism which aimed at saving the disembodied souls, the focus of the second phase of mission was on humanity in its wholeness. Looking closely at the first two phases of mission, it is obvious that they are largely anthropocentric in nature.

The current situation of climate change and environmental degradation, on which agriculture has a significant contribution, calls for the third phase of mission. The third phase of mission must continue to proclaim the reign of God while moving beyond the earlier approaches to a wider vision of mission which encompasses the entire created order in terms of saving, redeeming and healing it by advocating human responsibility to care for God's creation (Ayre, 2008b:2).

This is quite important because so far there is not much reflection on preserving the integrity of creation and how it is linked to the church mission. It is an undeniable truth that Christian mission in the 21st century and beyond must include an ecological dimension. The church cannot afford to continue excluding environmental issues from the missionary agenda. Therefore, eco-mission emerges as a critical aspect of a holistic mission response to issues of climate change and environmental degradation. Correspondingly, Harris (2005:1-2) argues that traditionally the whole idea of care has been focused exclusively on human needs. Issues of environmental destruction and caring for God's creation have rarely seemed to appear in the picture of church mission. After decades of new ecotheological reflections, the church worldwide is being called to recover its ecological consciousness and explore ways of making Jesus known as the Lord and Saviour through caring for creation.

Notably, Christian creation care must today become a new area for mission, equally important in the agriculture sector which is closely linked to the natural environment.

The main reason for taking creation care through farming practices as mission issue is that the devastation of environmental degradation is impacting the church itself and the society, while also shaking the foundation of life patterns on earth. Describing this situation further, Gomez (2010:2) points out that climate change and its adverse impact is the evidence that the garden (earth) which human being is called to care for cannot withstand the pressure from human beings anymore.

The Bible makes it clear that God honoured humankind, out of all creatures, and placed on him [*sic*] the responsibility of being carers of the garden's resources. This means that human beings were meant to live an ecological life, a life that respects the health of the ecosystem and the sustainability of all forms of life. According to Gomez the most praise and glory that God can receive from human beings would be to honour and respect the entire created order by seeing themselves as part of it and taking ecological responsibility in all that they do, including agricultural activities. This is the case because God considers the entire human community as his children who are responsible for creation and everyone in every sector must participate in taking up such valuable responsibility.

Theologically, mission does not belong to the church. Rather, it belongs to God who has invited the church to participate in it and God himself, in his trinity, is the principal actor. In this endeavour of seeking to participate in God's mission, the church must search for a particular spiritual framework which affirms both human life and integrity of creation. Since God's mission is holistic in nature, focusing on evangelism and growth of the church alone does not make such mission to be a holistic one. Without underplaying evangelism, "the holistic understanding of God's mission has to extend mission task and responsibility to all kinds of social, economic and ecological activities" (Barlia and Kim, 2010:25). God's mission is concerned for integrity of life.

Therefore, in performing mission today "the respect for integrity of life has its roots in understanding that life is a gift from God. It is also based on the notion that *oikos* was created and affirmed to be good" (LenkaBula, 2009:40). Then it comes naturally that the church must react responsibly for anything that compromises the integrity of life within the household of God (earth). Based on missional and theological foundation of mission, such church reaction entails the need to embrace "the struggle against injustices,

ecological degradation and marginalisation of people” on various bases (LenkaBula, 2009:41).

Mazibuko (2003:208) rightly argues that the church does its mission in a particular context. By context it means that real life situations are the contexts in which the mission is being carried out. Therefore, speaking about God’s mission is actually underlining that the history of salvation takes place on this earth in the midst of people’s real life situation. This means that what is happening in the context supplies some information which, in turn, shapes the focus of and practices of mission. In this regard, integrity of life which is threatened by unsustainable agriculture, the emergence of ecological problems and climate change at large must inform and shape the focus of mission of the church, especially in Tanzania. In other words, these issues create a new context for theological, ecclesiological, and missiological reflections and operations. The church must take cognisance of the fact that a continued unhealthy environmental problem poses a serious challenge to God’s mission of maintaining and sustaining the integrity of life. Therefore, faith communities are to be encouraged, or even challenged, to take responsibility to respect and protect the integrity of creation which supports all forms of life on earth (Mazibuko, 2003:222-223).

In the light of this, Hewitt (2012:204) correctly asserts “mission is best expressed through praxis and the church’s mission should be focused in addressing issues of human development... the church does not exist for herself but as God’s servant for the world.” On the basis of this understanding, issues that confront the world today create a context for the church to practice and participate in God’s holistic mission. In the context of Tanzania, for a number of years, agricultural methods that are environmentally unfriendly, as discussed in chapter three of this study, have contributed significantly to the changing climate. In this situation the mission of the church should include advocating for life-sustaining farming methods as opposed to the current practices that are life-denying in many respects. The church cannot remain silent as human beings continue to do harm to the natural environment in service of their selfishness and greed based on the “quest for growth progress and unfettered development” (Hewitt, 2012:212).

The context of climate change has increased vulnerability of many people, hence “greater human solidarity” must be sought in order to minimise its catastrophic impacts and foster engagement in transforming ways of life (Hewitt, 2011:80-81) as well as economic activities, including life-enhancing agriculture. The crown of creation [humankind] cannot be demonstrated through dominion as domination but through participating in God’s passion for the world, the whole creation (Borg, 2010:253). Pickard (2009), reflecting broadly on the contemporary mission practices, insists that in order to advocate and promote life-affirming agriculture in the time of climate change, a collaborative mission approach must inform church’s participation in God’s mission. In his [sic] opinion, the whole idea of collaborative mission takes into account the interconnected nature of life of the triune God that shapes the entire mission of God (Pickard, 2009:4).

In the light of this, cultivating an African Christian ethic of care to promote sustainable agriculture will be effective if it is done through collaborative mission. By collaboration it means that all areas of church mission and ministry must include ecological issues as part and parcel of the mission agenda. To use Pickard’s (2009:7) term, this collaboration can be “intra-ecclesia or inter-ecclesia” both at micro and macro level of the church. Given the magnitude of the problem of climate change, especially as it is exacerbated by the life-denying farming practice in Tanzania, different aspects of the church’s mission approach must ecologically work together to promote life-giving farming practices. Supporting the same idea, Xu and Wei (2010:277-278) states:

Climate change is solvable only if we humans work together across nations, cultures, religions and socioeconomic status. Solution to climate change calls for cooperation among governments and international organisations. Solving climate change can also start with us as individuals, families and communities by reducing our carbon footprints every day.

This means that in order to save the earth which is in peril, all human being must change their ways of life and the basis for their decision in daily life. The current human disposable life which puts much pressure on earth due to the huge amount of stuff thrown away need to transformed.

7.7.3 Sustainable agriculture as pastoral issue: An ecological therapy

As has been noted earlier in this study, especially chapter three, farming practices which unquestionably and uncritically embrace modern technologies stand at the top of the causes of the degradation of the environment in Tanzania, as elsewhere in Africa and the world at large. As a result of such uncritical adoption of modern farming technology, agriculture has continued to degrade the natural environment and threaten life on earth, especially in climate change issues. On the basis of this reality the central vision of integrity of life or abundant life is being compromised and it is certainly obvious that it cannot be realised. It is the holistic approach to the church mission that will redeem this situation.

Having this picture in mind, Kyomo (2000:61) notably infers that the issue of climate change and environmental crisis in Tanzania and elsewhere in Africa is a pastoral challenge. This is to say pastoral ministry can offer a significant contribution in bringing about ecological therapy, due to the fact that, *inter alia*, pastoral ministry focuses on the healing of the broken relationship and transformation of the inner heart, making it capable of either coping, preventing or solving a particular situation. It involves rethinking in more fruitful ways regarding how human beings ought to lead their lives (Held, 2006:3). In order to ensure ecological therapy in the context of climate change and environmental degradation, especially in Tanzania, the relationship between human beings and the created order must be redeemed. Through pastoral ministry, African Christians can be easily motivated not to abandon some of the helpful traditions that link them to the natural environment, since such helpful traditions are an African heritage whose purpose is to “sustain and enhance life” (Kyomo, 2000:61).

In addition, through the pastoral ministry, an African cosmovision, as discussed in chapter 5 (section 4.3), which has its root in an African worldview can be re-created that will in turn enhance or transform human attitudes towards the natural environment and enhance environmental care responsibility vested in all individuals. Recreation of an African cosmovision will result in uniting people together in order to advocate for ecological therapy through life-centred farming practices, as well as in all other economic sectors (Kyomo, 2000:62-63). Such a cosmovision, adds Msafiri (2007:234), will provide

rich, profound and insightful African ecotheological values that will enhance a more life-centred and holistic moral theological paradigm, the end result of which will be enhanced ecological therapy and liberation of all forms of life.

In line with Kyomo and Msafiri, Lynch (2002:16) has further pointed out that to the larger extent, pastoral ministry is “informed by the ideas about what is valuable in life and what it means to live well.” This suggests that pastoral ministry is always a search of good life. On this basis, it becomes crucial whether or not the ministry brings in any sensible vision of good life and whether or not such vision of good life is adequate, if human’s and non-human’s well-being is to be realised, and finally whether or not such vision for good life is sufficiently promoted through pastoral encounters (Lynch, 2002:17). This means that in the context of ecological crisis which poses a threat to life, vision of good life is likely to influence pastoral ministry in transforming human attitudes towards nature.

According to Best (2002:19) the three types of pastoral ministry (reactive, proactive and developmental) can be helpful in transforming people’s attitudes to the natural environment, from a pastoral perspective. Reactive pastoral ministry is helpful in addressing environmental problems that are already evident. Proactive pastoral ministry is helpful in assisting people to prevent life-threatening practices such as degrading the natural environment or uncritically applying modern technology farming methods. Finally, developmental pastoral ministry is about the provision of particular skills and knowledge or equipping people to be responsible citizens for their own lives and the lives of others. All these together present a useful pastoral approach in developing transformed human behaviour in relation to environmental problems which exacerbate climate change.

7.7.4 Sustainable agriculture: A key to African Christian ethic of care

The fact that care has got many forms, has made it difficult for scholars to reach an agreement as to what should be taken as the meaning or precise description of it. However, it is always clear when the word is used denoting some sense of connectedness and relatedness and re-affirmation of such connection (Held, 2006:29). Generally speaking, caring has to do with how one feels about a particular issue and such feeling

eventually leads to some action or certain patterns of practices. For example, if someone cares about global climate change and its adverse impacts for the current and future generation, it will lead to knowing the way that the future generation will judge the present generation for their irresponsibility. Such care is likely to transform certain attitudes and daily practices in order to decrease harm to the natural environment that increases climate variability (Held, 2006:30). Furthermore, a caring relationship goes beyond any kind of caring that takes place in the families and among friends, even that which take place in some institutions of welfare. In its deep sense, care tends to focus on the “values that bind groups together, bonds on which political and social institutions can be built and the global concerns that citizens of the world can share (Held, 2006:31).

It is widely accepted, acknowledged and agreed that care is an important element in human life and that a provision of adequate care in all aspects of life constitutes valuable social capital. Held (2006:3) affirms this reality when he [*viz*] says “every human being has been cared for as a child or else would not be alive.” Unlike many other dominant approaches to moral issues such as Kantian moral theory, utilitarian theory and virtue theory, an ethic of care is a recent approach to moral concerns. The distinctive nature of an ethic of care is based on the fact that it focuses on relationship (Held, 2006:4).

Therefore, an ethic of care can serve as an important ingredient in forming and reforming Christian character that will result in an earth-caring community which can positively and responsibly engage with the world of agriculture. When an ethic of care leads one’s life, especially in the world of agriculture, small holder farmers can potentially be motivated, encouraged and challenged to re-think their management of the soil (earth), crops and livestock. As a result, agricultural systems that are more sustainable than the dominant ones are likely to emerge (Fick, 2008:104)

7.8. A formation of earth-caring community to enhance sustainable agriculture

In the context of climate change, argues Munga (2012:29-30), human beings need to be reminded that this earth is the home in which both human beings and non-human beings live. Therefore, the first step towards the solution to climate change is to change the ways that human beings think and act in relation to the rest of creation. Communities of faith have got potential power that can be used to create motivation for change and to help

the members of such communities to take necessary steps for fighting against issues of climate change and taking a common global responsibility (Munga, 2012:31). Changing human beings entails formation of the earth-caring community. In the world of agriculture, threatened by incidences of climate change, knowledge alone (facts) is not enough. Rather, wisdom which is biblically preferably emphasised offers a helpful basis for the wise use of natural resources.

According to Fick (2008:109), biblical teachings distinguish wisdom from knowledge. Whereas wisdom constitutes knowing what to do, knowledge is largely about knowing just about the facts. On this basis, a farmer is not someone who knows methods and seasons (facts) of farming, but more importantly the farmer is in “prayerful, attentive relationship with the Creator, seeking wisdom for all questions of farming” (Fick, 2008:109). This is a comprehensive wisdom of agriculture which denotes the care and management of soil and crop production. Therefore, the context of climate change exacerbated by unsustainable agriculture serves as a reminder in twofold aspects: Agriculture must be viewed and managed in a more holistic manner and although means for tilling the soil are acceptable, there need to be ways through which soil fertility is maintained (Fick, 2008:114). This is important because, according to Hauerwas (1983:102), the church as social ethic does not concern itself with what to do, rather it is concerned with proper interpretation of “what is going on” in the society. It is such proper interpretation which eventually determines the proper response to what is going on. Such re-orientation should ensure that the formation of earth-caring communities follows, but is not limited to, the following procedures.

7.8.1 Re-envisioning Christian discipleship

Conradie (2011b:1-2) in his paper on “Mission and the globalised world: A new Christian vision for discipleship” has made a significant reminder that despite the changes that are being experienced in terms of globalization, environmental challenges and global warming, the world remains God’s world. If the church is to participate in God’s mission in the world appropriately, there is a need for a new vision in terms of where the mission strategies should be directed. The mission of the church has to follow God’s purpose to restore and heal the broken world in all aspects. In this context, adds Bosch (1996:1), the church cannot continue with the traditional ways of doing mission which narrowly focuses on just propagation of faith, expansion of the reign of God, conversion of the

heathen and founding of the new churches. The same concern was also recognised during the Edinburgh centenary celebration when Bevans (2010:1-2) commented:

We live and practice mission in a different world from a century ago when missionaries believed that the world would be evangelised in their generation. We are in a post modern time where the confluence of the power of the gospel and the power of science are evident. Specific progress has brought amazing things, but for good and for worse.

This suggests that traditional ways of understanding and doing mission in the contemporary world must recognise the real context and challenges that affects lives of people and the world at large. Considering issues of global warming and climate change and its adverse effects, Tan (2010:124) concedes:

The issue of climate change is about life and death of the communities. Ecological crisis is a crisis of the worldwide Christian community. This crisis is not only local, but has an impact on the world. The interconnection between global and local is inevitable, especially in the face of intense globalisation when the nations are interdependent upon each other for the survival and life.

Generally, climate change is the crisis which threatens the earth as a whole and the human community in particular. In this context, mission is about a commitment to ecological wholeness. This means that the church approach to God's mission has to incorporate issues such as justice, peace and integrity of creation, thus inaugurating the holistic nature of mission praxis (Tan, 2010:125-126). The end result of this kind of approach to mission will be restoration and transformation of human mentality leading to consciously effecting changes in a wider perspective.

In other words, people's minds and attitudes are likely to be transformed from following their own agendas to living and following God's purpose (Blackaby and Blackaby, 2006:20). Similarly, it has been argued that all Christian institutions have to help their members to use their Christian tradition and doctrine to make sense of the world and the way that they should lead their lives. In the process of so doing transformation of their hearts, values, attitudes and desires are likely to occur, especially when critical thinking rather than mere indoctrination is well encouraged (Nord, 2007:34).

Unlike humankind's purpose, God's primary concern is a healthy relationship with Him [*sic*] that has an implication on the way people relate with each other and the rest of creation. Even Israelites were delivered from slavery not necessarily to go to a physical and geographical Canaan as it is traditionally understood. Rather, Canaan is used as a metaphor that explains a situation where God's people may be free to develop a healthy relationship with Him [*sic*], their fellow human beings and also God's created order (Blackaby and Blackaby, 2006:103). This is how the mission of the church is always different from God's mission.

Based on the fact that mission is not the work of churches or mission agencies but God's work, which include creation, providence, and eschatological consummation, discipleship or Christian formations is one of the metaphors that might allow discernment of human places and roles in the whole household of God (Conradie, 2011b:6). The strength of this metaphor, with regard to responding to ecological issues today in relation to the world of agriculture, lies in the fact that it is associated with dedication, loyalty, bold humility, discipline, obedience and counting the cost of such discipleship (Conradie, 2011b:7).

All these tenets and qualities, when interpreted ecologically, present the potential of producing believers who are rightly committed to the protection of life and integrity of creation. This means that the place to begin when considering the cultivation of an African Christian ethic of care into human daily dealings with natural environment is to review the Christian formations process and contents to ensure that discipleship becomes an issue of total commitment to the course of saving life in all its forms. This suggests that Christian discipleship should include caring for God's creation through, *inter alia*, farming practices. Arguing further on this aspect, Hauerwas (2001: 166) insists that discipleship formation should allow people to see and describe themselves, others and the world at large in a more responsible, caring manner.

In this new vision for discipleship, moral formation should be taken seriously with the understanding that it seeks to compliment the classic moral categories and delve deep to see what is visible and invisible. In the international debates on climate change moral vision is well recognised, hence there is no reason why such moral vision should not be part of Christian formation as will be discussed later in this chapter.

The importance of re-envisioning Christian discipleship lies indicatively on the message of salvation in Christ which is accompanied with a hope for transformation of the world (Conradie, 2011b:7). In line with Conradie about basing Christian discipleship on the message of salvation, Moore (2004:81) contends that salvation as kingdom of God needs a broader understanding which ties personal renewal to the broader cosmic purpose of God. As a result, this will avoid the traditional view of salvation as a “reductionist soteriological pitfalls of both, the social gospel and fundamentalist revivalism.” Moore (2004:89) continues to argue that holistically understood, Christian soteriology involves “personal forgiveness of sins, destruction of relational barriers (restoring broken relationship) and renovation of the cosmos.” It is so misleading when the message of salvation is construed as a “flight from this world.” Rather, it is the “redemption of the cosmos through the messianic accomplishment of Jesus Christ (Moore, 2004:93).

Explaining this further, Moltmann (1996:159) contends that; “Christian eschatology/salvation must be broadened into cosmic salvation, otherwise, we fall in the trap of teaching not redemption of the world but from the world, not of the body but of the soul from the body.” In a new vision of discipleship, people’s thoughts of other worldly, which influences their irresponsibility for the natural environment because they are in exile passing by, must be deconstructed. Instead, new formation which includes moral vision must be based on the premise that “redemption is aligned towards humanity whose existence is still conjoined with nature” (Moltmann, 1996:160).

Therefore, it must be clear that it is unconceivable to think of any salvation for humankind without “a new heaven and a new earth.” It means that eternal life for human beings is not attainable if there is no effort made towards changing the cosmic conditions of life today, especially ecological crisis (Moltmann, 1996:260). People of Christian faith must understand that the earth is the *oikos* of God and that they have been given a particular role to play to ensure that the entire life system is being respected, honoured, and protected for the common good of all (Muller-Fahrenholz, 2000:154). Akrong (2008:63) is correct, therefore, when arguing, as he reflects in African Christianity saying, “at the centre of African Christian mission is a new image of Christianity as a religion that is capable of equipping people to deal with the challenges of daily life and other numerous mundane concerns.”

When Conradie uses the term “new vision for Christian discipleship” to extend a call for rethinking Christian formation, Moltmann (1997:50), as he reflects on ‘ecological

doctrine of creation', appeals to the need for naturalisation of human beings in order to overcome the alienation of nature brought about by human beings. For Moltmann (1997:51), this should mean:

Human beings should find a new understanding of themselves and the new interpretation of their world in the framework of nature. Being fundamentally a product of nature, human beings should understand nature as the great subject which brings forth new forms and manifestation of life, last of all is human being. Human being therefore is an object since he is a product of the productive nature.

Similarly, envisioning Christian discipleship, argues van Proogen (2004:313), is the process of re-embedding the disembedded, having in mind the fact that human beings have turned the entire creation to be their own object. Therefore, a new vision for Christian discipleship aims at transforming human attitudes towards the created order. This will trigger a new Christian anthropological theology which is more liberating and life-enhancing. This is of particular important because the change of the heart or values has to go with the change of practice. As Wirzba (2003:149) points out "environmental crisis, in fact, can be solved only if people, individually and in their communities recover responsibility" entrusted to them thus enhancing and liberating life.

Taking this argument further, van Proogen (2004:314) continues to outline some important elements of Christian anthropological theology which can be more liberating and life-affirming. First, he argues, Christian anthropology can be liberating and life-affirming only if it succeeds to bring its own specific perspective formed by the reality of God's kingdom, of which the Bible and Christian spirituality speak about. Second, Christian anthropology can be liberating and life-enhancing only if it speaks in a contextual way, registering the suffering and hopes of its concrete historical context (van Proogen, 2004:315).

Third, Christian anthropology becomes liberating and life-supporting if it recognises that human beings are priests and priestesses whose task is to see everything that God made receive deserved due respect in order for it to foster true life. Fourth, in order for Christian anthropology to be more liberating and life-sustaining, its theological development must be characterised by a turn from eschatological to ecological focus, from the concept of time in the progress of human history to the concept of space in the life-giving organism (earth). This means that transforming human attitudes towards

nature is quite significant because human history occurs within ecological conditions of the earth, thus ecological problems must trigger and force the church to offer a theological rehabilitation (van Proogen, 2004:343).

Emphasising further on Christian discipleship formation in the time of climate crisis and other global challenging issues, Habermas (2009:13,14) proposes that such discipleship formations which are holistic in nature should provide Christian education, largely responsible for Christian formation, which covers five key areas of church's mission.

First, Christian discipleship formation must be an education that enables disciples to fully participate in the proclamation of the Gospel (*evangelism*). Second, Christian discipleship formation should be an education that enables disciples to be nurtured in relation to God and the other (*koinonia*). Third, Christian discipleship formation has to be an education that equips disciples for service that focuses on God, people and the rest of creation (*diakonia*). Fourth, Christian discipleship formation must be an education that transforms disciples for the kingdom of God voicing issues of concern for world-wide justice, peace and righteousness. And fifth, Christian discipleship formation must be an education that equips disciples for worshipping God (*liturgy*). A kind of education that stretches itself in this wider perspective is likely to be a life-fostering tool in many aspects, with the potential to promote life-enhancing farming practices in the time of climate change threats.

Another area which is critical for disciple formation is pastoral formation. According to Astley (1996:270), theological education or training and spiritual formation are all part and parcel of Christian discipleship formation, which belongs to the Christian community as a whole. Therefore, pastoral formation is another area where holistic life-enhancing discipleship formation must direct its focus. Pastors are the people or disciples who are being trained to take responsibility of Christian formation in general, as well as in various specific ways. In order for them to be able to offer a holistic and life-enhancing Christian formation that will produce responsible disciples/Christians who are capable of protecting the integrity of creation, their training process and contents must be holistic and life-giving as well. It is for this reason that Gula (2002:114) asserts:

Pastoral formation is a formation of conscience. It is a process of continuous conversion to what is true and good, a search for who we ought to be and what we ought to do in faithful response to God's call. The obligation of the church is

to ensure that pastoral conscience is properly formed for holistic and life-affirming ministry in the world.

This means that forming pastoral conscience is not a 'once and for all' duty rather it is a lifelong task and an ongoing process of conversion. The fact that human creatures are intentional and relational beings, argues Thompson (2011:44), means that it makes no sense if the pastoral formation focuses only on spiritual matters that will lead to the formation of the community undergirded by common ethos of responsible care. The pastoral formation must be broadened in such a way that pastors are holistically equipped to serve humanity as it stands in relation to the rest of creation in whatever they do, e.g. engaging in the world of agriculture.

On this basis, Astley (1996:270) has suggested that a holistic and life-enhancing pastoral formation must focus on three key components of the aim of Christian education: Strengthening Christian faith, enhancing Christian life and consolidating Christian ministry/mission in its broad sense. Furthermore, Fiorenza (1996:322) adds, "pastoral formation is not merely about imparting a traditional set of doctrines, nor is it simply about imparting a set of skills, but it is also about development of an independent character that will serve the course of common good of all." In this regard, holistic and life-enhancing Christian education must always seek to nurture individual Christians in a more deeper, comprehensive and all embracing manner (Fiorenza, 1996:323; Lindbeck, 1996:287).

Generally speaking, Schaefer (2009:1) insists that in the context where earth is in peril due to humankind's unsustainable treatment of God's creation, Christian formation is likely to play a vital role in reminding humanity about their God-given vocation to preserve and protect the integrity of creation. The ongoing degradation of God's creation through various human activities, agriculture included, requires a critical examination of the current tradition of Christian formation, with the aim to improvise expressions of Christian faith which are relevant, holistic and life-enhancing to the conditions of the earth today. The new Christian formation (discipleship) must cohere with the current knowledge of the world and should be helpful in addressing ecological concerns which have plagued the system of life on earth. The current traditions of Christian formation must be re-evaluated through an ecological lens and allow attribution of goodness, beauty, sacramentality and integrity of God's creation to stimulate new thinking, new attitudes and the desire for being responsible carers of the earth.

This means that the purpose of Christian formation in general must be to produce authentic human beings who responsibly respond to God's call to serve life. Any African Christian formation process, in order to be authentic, must reflect an *Ubuntu* worldview and specifically *Ujamaa* for Tanzania, which stands as the soul of African/Tanzanian society. *Ubuntu* and *Ujamaa* are helpful resources in the aspirations of a new discipleship formation.

In this regard, Cornell (2012:217) has pointed out that embedded in *Ubuntu* and *Ujamaa* metaphors is a proclamation of a moral way of life for all humankind in their respective contexts. According to Mnyandu (2003:304), *Ujamaa* [*Ubuntu*] is a centrepiece of existence and a primary concern of God the Creator. Apart from representing God in creation, human beings also share a certain level of divine being by possessing some divine qualities such as intelligence and creativity, which are part of the nature of God himself. On the basis of grace and mercy, God gave humankind these qualities as an invitation to participate in God's divine mission on earth. In this way humankind has been gifted to be:

God's intelligent, creative, assistants and responsible representatives in the world. The central purpose of God which depends on humans for brain, thoughts and priestly intercession but more importantly, which depends on God for rain and fertility. In turn, humankind depends on earth for livelihood: food, shelter, possessions, wealth and recreation... (Mnyandu, 2003:305).

In the African context, *Ujamaa* [*Ubuntu*] constitutes the most important quality of a human being. Any person who possesses a greater degree of *Ujamaa* [*Ubuntu*] "is praised as being caring, humble, thoughtful, considerate, understanding, wise, godly, generous, hospitable, mature, and virtuous and blessed. *Ujamaa* [*Ubuntu*] is an inner state of complete humanisation shown by these characteristics" (Mnyandu, 2003:306-307). Therefore, African Christian formation cannot be effective if done outside the framework of *Ujamaa* [*Ubuntu*]. In fact, the central objective of African Christian formation should be modelling an authentic human being who takes responsibility to promote life and defy any threat to life, hence moving towards the formation of a Christian earth-caring community.

7.8.2 Re-envisioning African Christian moral formation

A Christian faith community is a community of virtues which flows from faith, hope and love, as depicted in the crucified saviour. It is for this reason that Hauerwas (1983:103) has argued that a Christian faith community is a community of the new age that has the obligation to continue existing in the old age, shading lights of the new hope in God “who has promised that faithfulness to the kingdom will be of use in God’s care for the world.” This means that by the virtue of hope in God, a Christian faith community becomes a tool for God’s faithful caring for the world, the home of all.

Therefore, as discussed in section four of this chapter, cultivating an African Christian ethic of care into farming practices is not a once off solution. Rather, it is a process of transforming human attitudes towards creation and reclaiming care as a God-given vocation. In this process, the traditional understanding of the Church’s mission to save the soul must be transformed into ecological mission where issues of the integrity of creation are taken seriously. Such a process should be informed by the new understanding that the gospel is not an account for personal salvation alone, but it is good news of creation of the new community of peace and justice, for the common good of all (Hauerwas, 1983:105).

In the context of climate change, exacerbated by irresponsible farming methods, among other human activities, this means that life-affirming agriculture must be incorporated into the church’s mission agenda. Also, the church needs to consider life-affirming agriculture as a matter of mission, a matter of faith, a matter of pastoral ministry and a matter of African Christian ethics in general. This will place the church in the position where its missional praxis becomes more holistic and more life-affirming, hence aspiring towards a formation of earth-caring community through life-centred agriculture.

The idea of forming the earth-caring community agrees with the proposed thesis made by Hauerwas (2001:118) when contending that the faith community (church) does not need to have a social ethic, rather it has to be a social ethic itself. It means that it is not enough for the Christian faith community to develop principles and policies as ethical

basis, instead, Christian ethics must be the affirmation that God has deliberately called and formed Christian faith community to serve him through serving the world.

Generally, this study has argued that the challenge of climate change is largely the result of unsustainable relationship between human beings and the rest of creation. While there are many factors that have transformed humankind from being responsible creatures to being more exploitative of the rest of creation, it is evident in this study that theological reflections, as discussed in chapter four, have had a significant contribution on the formation of human attitudes and worldviews which are detrimental to the natural environment.

This is more evident in a farming sector, especially in Tanzania for example, where human beings have uncritically and irresponsibly tended to use advanced technology in their agricultural activities, at the expense of God's creation. Since Christianity has played its role in damaging the earth, it can also contribute significantly to re-forming human attitude towards a more responsible and caring nature, particularly in the world of agriculture.

Emphasising the importance of Christian moral formation in response to issues of climate change and environmental degradation in relation to agriculture, Wilson (2003:151) comments; "The problem of environmental crisis is now well understood. We have a grip of its dimension and magnitude and some workable strategies have begun to take shape. However, these are not enough; a new strategy to save the earth with ethics begins."

The point that Wilson is trying to make in this sentiment is that apart from all technical approaches that are already in place to address climate change and environmental problems, an ethical approach is equally important in this regard. The reason for the need for an ethical approach is that to address these issues it requires or involves decision making at various levels i.e. individual, family, regional, national and international level. It is when those decisions are made ethically that their impacts in real life begin to emerge. It means that moral reasoning is important, even when those decisions are being made on technical approaches to climate change and environmental crisis.

Explaining further the importance of moral reasoning for decision making in any level of the society, Wilson continues to argue that moral reasoning is not something that has been invented to address or respond to a particular situation. Rather, moral reasoning has always been the vital glue of any society, a means through which transactions are made and honoured to ensure the survival of all in a particular society. In principal, everyone in the society is guided by certain ethical precepts and the community expects individual members to follow moral leadership. Moreover, continues Wilson (2003:189), it is well recognised from all walks of life that problems can be solved and resources to address a particular problem can be determined by whether such decisions were ethically sound or not.

Similarly, Van Niekerk (2005:12) has identified four major reasons why it is important to give special attention to Christian moral formation in the current sustained search for proper and long lasting ways of addressing various problems, including climate change. The first reason is that in Africa there is a multitude of expressions of moral erosion which goes beyond mere “occurrences of crime and violence” (Van Niekerk, 2005:102).

These expressions of immoralities can be summed up by this statement, “lack of moral responsibility.” This is an indication that human beings are at the stage where moral rehabilitation is highly significant. Almost every day across the world, Africa and Tanzania in particular, homes, schools and other institutions and individuals are experiencing and feeling the absence of discipline which results in an unhappy life. Secondly, reflecting on all these moral concerns, it becomes evident that any attempt to find a quick and easy solution to such problems cannot be an answer. In the light of this, much substantial effort is needed to uncover causes of crisis and begin to lay down the moral foundation that will lead to the most important issues of justice, care, faith and responsibility (Van Niekerk, 2005:103).

The third reason is that there is no government that will be able to solve moral problems using coercive measures. While the government’s dedication, commitment, responsibility and accountability is highly valued, faith communities have something unique to offer if they begin to practice what God has called them for, “to be the salt of the earth and light for the world”, especially in these challenging times.

Fourthly, moral formation is a multifaceted process with diverse key players. Therefore, Christian faith communities need to begin to pay attention to various “building blocks of moral formation” (Van Niekerk, 2005:104). This has to do with moral education which offers a kind of moral communicative infrastructure or framework through which moral education builds various “sets of educational aims, contents and methods” (Van der Ven (1998:34). Van der Ven continues to detail an example of seven concepts that stand behind moral formation as building blocks. He argues that moral formation happens in two different levels, namely informal moral education which involves discipline and socialisation and formal moral education, which involves transmission, clarification, emotional formation and character formation (Van der Ven, 1998:36).

This means that informal moral formation is something that happens in the informal settings of interaction “between a child and its parents, siblings and anyone else who participates in the life of the primary groups, particularly the family” (Van der Ven, 1998:35). To the larger extent, this involves other informal settings of broader community such as the neighbourhood, associations, church, etc. Furthermore, formal moral education is the moral formation that occurs in a more organised setting whose primary purpose is to “systematically and methodically coordinate education activities, formalise educational tasks and responsibilities, exercise professional leadership in the field of education and explicitly legitimise its educational structures, procedures and processes” (Van der Ven, 1998:36). Such organised units may include primary education, secondary, tertiary and adult-education levels as well as parishes, congregations, and other church institutions.

In the context of Christian faith communities in Tanzania and especially in the Southern Diocese of the Evangelical Lutheran Church in Tanzania for example, informal moral formation is expected to happen at the family level where it is believed that the strong church begins to be constructed or formed. This is well reflected in the infant baptism liturgy where parents and god-parents are asked to promise to live according to the Christian faith and that the children will be nurtured, raised and parented in the Christian manner (KKKT, 2012:489). Similarly, the symbol of the Lutheran theology which is very ecological in nature [see figure 1] portrays the same expectations through the use of different colours, as discussed below.

Figure 1



Adopted from the Lutheran Study Bible (ELCA, 2009:1536)

This theological symbol presents a Lutheran church theological distinct. It means that from its inception, Lutheran church theology embraced ecological aspects, but such a theological distinct has been largely marginalised. As it can be seen in the symbol, the cross at the centre is placed at the heart to symbolise faith and salvation in the crucified Christ. Since the heart represents life, it then suggests that by nature Christian faith must be life-giving rather than life-denying. The heart on which the cross is placed is located in the midst of the white rose (a flower), followed by blue sky and gold colouring (symbol of beauty and health natural environment), all of which represents the non-human created order to symbolise that the Christian faith which is based on the crucified Christ is meant to give joy, comfort and peace - the wellbeing of the entire created order (ELCA, 2009:1536).

In the context of climate change and unsustainable farming practices which threaten the wellbeing of God's creation and life in general, this entails that Christian faith of that nature has to be environmental friendly. On this basis, it is anticipated that Christians of all ages, at least Lutherans, must uphold this kind of Christian-moral formation always "whether sitting, walking, standing, lying down or rising and keep them before our eyes and in our hands as constant token and sign" of human commitment to keeping the earth (Tappert, 1981:360).

In line with informal Christian moral formation, Christian faith communities in Tanzania have an opportunity for a formal moral formation in the Sunday school children, primary, secondary and tertiary education. In the Sunday school, there are four books

that are used in the process of grooming these new Christians (Christian formation). All of these books are titled *Tufundishe watoto* [lit. Let us teach children the Christian faith]. The central focus of these formation materials is God's concern for the entire world which He [*sic*] created. However, it is evident that most of the materials paint a clear picture of how God deals with human beings exclusively. For example, *Tufundishe watoto* book one (CCT, 2003: iii-iv) concentrates on two main areas: Christ's salvific ministry and individuals' encounters with God in both the New Testament and Old Testament. Equally, *Tufundishe watoto* book three (CCT, 1993:v-vi), selectively deals with some themes such as the story of creation, Jesus' ministry, God's call and promise to Abraham, the story of Joseph, the story of Moses and Israel's liberation.

Regarding the primary education, soon after independence Christian faith communities have been allowed to teach religious, in this case Christian education in all schools. In this regard, curriculum for primary school (standard one to standard seven) spells out three main objectives of teaching Christian education in the schools. The first objective is to strengthen faith and help pupils to know and live according to the will of God. The second objective is to help them to understand the relationship that exists between Holy Scripture and the world. The third objective is to enhance Christian and moral formation in general which, to the larger extent, focuses on human to human relationship (CCT, 1986: vi).

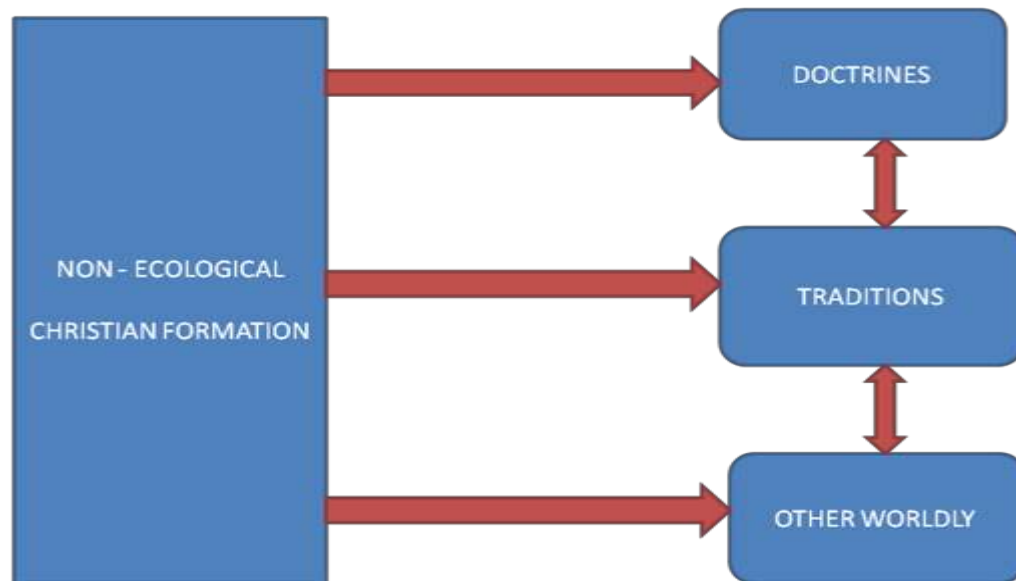
After primary school, Christian formation continues in the confirmation classes where *Tembea na Kristo* [lit. Walking with Christ] (KKKT, 2001) is one of the key text books. It is argued in this book that to teach Christian faith is about looking, thinking and examining human life before God in this world (KKKT, 2001:1). It is about enlightening human thoughts, words and deeds with the gospel. Therefore the central objective is to help confirmants to live godly lives in its entirety. Of the thirteen themes covered in this book, only one i.e. the tenth theme speaks about living a responsible life. However, out of twelve sub-themes in this section, no attention is given to human moral responsibility towards God's created order.

Haya ndiyo maisha ya Kikristo [lit. This is the way of Christian life] is the key text book used for Christian formation in the secondary schools. The central objective is to strengthen joint efforts of churches in Tanzania to nurture and enhance Christian moral formation

for those who are in the secondary schools. Although there is a mention of the importance of caring for natural environment, only one lesson in four text books i.e. form I-IV pays particular attention to ecological issues (TEC and CCT, 1998:21).

In the whole, the discussion above shows clearly that the Lutheran church, with special reference to the Southern Diocese, is an example of a church that has a well structured process of Christian formation. However, to the larger extent, such Christian moral formation has not been ecological in nature as it was intended; rather, the central focus has been on personal salvation from evils of this world, as discussed in chapter four of this study. The implication of this salvation over the entire created order, i.e. setting humanity free from all wickedness and misery in life, transforming human relationship with all creatures and making a new commitment to new ways that enhance life, has been given little attention. The figure below explains the framework in which such traditional Christian formation has been implemented, focusing largely on three main areas:

Figure 2:



In the light of the above figure, the central focus of the traditional Christian formation as discussed earlier has been on three areas, namely; imparting knowledge about various doctrines, traditions of the church and issues regarding hereafter's life (other worldly). In other words, adds Msafiri (2012:46), this kind of formation can also be largely called informative rather than formative and transformative. According to McDonald (1993:163), this traditional Christian formation has created a gap between knowledge of God and commitment to life-enhancing praxis, especially caring for the earth, the result

of which is the climate change experienced today, among other life challenges. This is because Christian faith communities are meant to serve as catalysts in promoting integrated responsibility towards caring for God's created order.

Emphasising this further, Gibbs (2000:21) argues that all human beings are created to be responsible not only at present but for the future generation as well. Therefore, this calls for a more integrated mode of Christian formation that includes moral responsibility to caring for the entire created order. This is of critical importance due to the fact that, adds Wurzburger (2001:12), human beings are responsible beings not only to the created order but also to God by the proper stewardship of all resources "placed at their disposal."

In this regard, Davis (2009b:84), reflecting on issues of farming practices in the context of environmental crisis that brings about the problem of climate change calls for "reciprocating connection in the pattern of the farm that is biological, not industrial and that involves solutions to problems of fertility, soil husbandry, economic, sanitation." This entails ensuring the health of the soil, plants and animals, farm and farmer, farm family and farm community, all of which are integrated together and guided by a Christian ethic of care.

7.8.3 Cultivating an African Christian ethic of care through eco-moral formation

As has been indicated earlier in this study (chapters 5 and 6), transforming human attitudes towards God's created order, especially in the Christian faith communities has to do with Christian moral formation. In this process, argues Erhard (2007:11), efforts must be made to define, identify, evaluate, arrange and re-arrange *ethos* (a distinctive character) as moral habitat which refers to the network of norms that can be obtained and practiced in a particular socio-cultural settings. In the context of climate change and environmental degradation, cultivating an African ethic of care is about establishing *ethos* of moral habitat as metaphor which explains a need for sustaining environment holistically. In the formation of an *ethos* that will safeguard natural environment, the dichotomy between human being and natural environment must be avoided making sure that human kind is understood as part of the entire God's creation. This is important because what is called culture in the modern world is the product of both human being and the surrounding environment where they live (Erhard, 2007:14). Also, this is

important because the earth pathology calls for human moral agency in response to the creative power of God. It is hard to heal the earth challenged by issues of climate change depending on human knowledge alone but also by listening to various voices of creation (Erhard, 2007:90).

The fact that the church is a moral conscience of the society entails that one of its roles is to promote *ethos* of moral habitat and nurture Christians in such a way that they gain an understanding of their responsibility in the world (Hauerwas, 1983:99). It is in this way that the church becomes a servant of the community and not a servant of itself, thus becoming itself a social ethic entity. Having this in mind, Hauerwas (1983:100) argues that viewing itself as servant of the community, the church will unceasingly labour towards ensuring that the “world understands what it means to be the world for the world has no way of knowing it is the world without the church pointing to the reality of God’s kingdom.” Therefore, cultivating eco-moral formation is one way of taking social responsibility in order to be a servant of the community. In the light of this, Msafiri (2012:38) infers that if the church is cognisant of being the servant of the community, it will unceasingly assist its members to “become role models and champions of caring and preserving our own environment, respecting biological rights of all created beings not only for today but for hundreds of generations to come.”

According to Willard (2006:53), Christian moral formation is a process of shaping one’s conscience or spirit and giving it a definite character. For Christians, such formation is one that leads to the conformity with the Spirit of Christ. In this process it is anticipated that the whole humankind (heart, will, spirit) takes on the character and quality of Jesus Christ himself and it is largely concerned with the need for inward transformation. Christian moral formation is based on the recognition of the fact that the inner-side part of humankind, a Christian and non-Christian alike, tends to develop and grow into certain levels of reality where a person is seen either as a good person or is not.

Due to the fact that people receive their moral formation as they grow and interact with others, which cannot be easily controlled, Christian moral formation is an intentional hand in the development process of the person (Willard, 2006:69). The need for Christian moral formation is brought about by the fact that the expansion of science and technology that came with great development to human beings also produces notable

ethical questions which do not seem to respond to any quick fix strategies. In this context, any person who is morally formed has the potential of providing a considerable service in their respective community (Pittau, 2000:141,150). Therefore, Christian eco-moral formation, according to Perrin (2007:225), is an ongoing integration whose result is to form self-responsible subjects within the community as a whole. In this regard, the emphasis of Christian eco-moral formation is shaping communitarian life while enhancing well-being of the entire earth community.

The focus of Christian eco-moral formation is to build a moral framework of values that serve as regulators of personal behaviour through guiding principles, rather than a mere fear of punishment or expectation of a reward. Eco-moral formation is much wider and more profound than behaviour management. Bowe (2003) has identified what he calls polarity of human nature which necessitates the need for eco-moral formation. The first polarity is the tension between freedom and finitude in which human beings always live. It means that in human nature there is always a sense of limitless possibilities, immense potentials and capacity for greatness on one hand. A good example of this is the human desire for unlimited economic growth which has a great impact on the current climate change and environmental problems. On the other hand all these potentials that humankind long for are tempered and constrained by finite reality - some situations emerge and place limits on what was deemed to be unlimited (Bowe, 2003:34).

The second polarity refers to the tension between rationality and irrationality, also between truths and error. Bowe (2003:35) argues that within human beings there is always a tendency of leaning towards good and truth, whereas at the same time human beings are seduced by falsehood, led astray by some competing claims and often unable to discern between good and evil.

The third polarity revolves around issues concerning responsibility and impotency. On one hand human beings are aware of what is required in a particular situation whereas on the other hand there is a sense of being weak and impotent, incapable of doing the very thing that one knows s/he is called for.

Fourthly, there is a polarity or tension between anxiety and hope. There are times when one feels a growing uncertainty that disturbs and brings great anxiety, while other times

are full of tension that exists between an individual's life and participation in the wider society. In principal, a human being is a social creature whose complete fulfilment and satisfaction is found in relationships and the entire created order (Bowe, 2003:35).

It is these polarities of human beings that create the situation where eco-moral formation can potentially assist in developing a set of values that will guide human beings in the interaction with the wider society and promote moral responsibility towards caring for God's created order, especially through life-enhancing farming practices. Similarly, Koutsoukis (2009: iv) contends that given the nature of humankind, developing values as an ideal will guide not only human behaviour but also guide decisions on what is right and wrong, good and evil. Eco-moral formation spells out what is important in terms of conduct, interaction with others and how to live a meaningful life in the wider world.

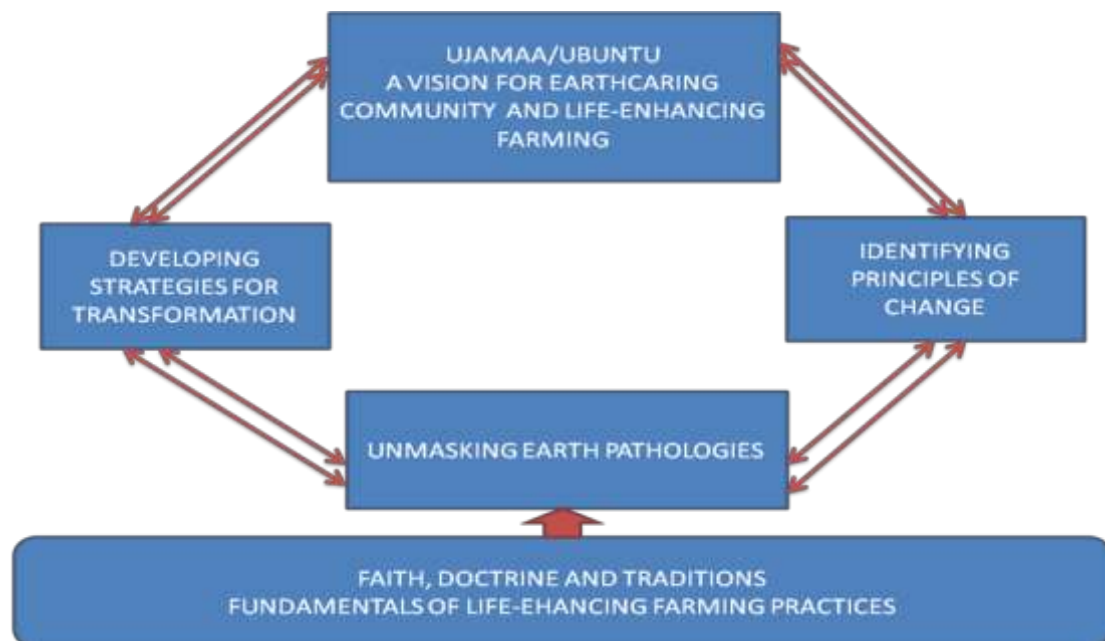
Eco-moral formation is a proactive approach towards managing life, choices, priorities and the entire creation. In order for such moral formation to be more comprehensive, especially in African context, it must be structured within the spirit of *Ubuntu* or *Ujamaa*, which is another version of *Ubuntu* in the context of Tanzania. These two terms emerged as an African response to the inadequacy of the Western worldview in relation to the African needs and African lifestyle of making sure that both rich and poor in the society are all secured (Ekanem, 2012:55).

According to Cornelli (2012:107) apart from other factors that influenced the construction of African socialism in the name of *Ujamaa* in Tanzania, this concept is largely rooted in African indigenous lifestyle which incorporates extended family, participation and inclusion of all and communal lifestyle. Therefore *Ujamaa* and *Ubuntu*, like other African concepts in other parts of Africa, are used to offer a comprehensive understanding of the African worldview. Primarily, this worldview is based on key values of African communities among which are "intense humanness, caring, sharing, respect, compassion and associated values, ensuring a happy and qualitative human community life" in relation to their surroundings (Broodryk, 2006:2). Therefore, an eco-moral community that is likely to offer a significant contribution towards the formation of an earth-caring community that will adopt and promote life-enhancing farming practices is necessary. This constitutes one of the best ways in which an African Christian ethic of

care can be well cultivated in order to promote sustainable agriculture and human moral responsibility towards God’s created order.

Apostle Paul believes in the proper formation of the community if a necessary transformation of the society is to be realized. He correctly understood that to transform the traditional created dichotomy between people and the world, an example of which is the dichotomy between Jews and Greeks/Gentiles, hard work must be done for the formation of an inclusive and responsible community where common identity and norms are inculcated (Thompson, 2011:43). Therefore, the formation of an earth-caring community that is based on comprehensive African worldview must also be comprehensive in nature, the end result of which will be the creation of Christian cosmic spirituality, providing a better understanding of the world as organism and promoting covenantal relationship between human beings and God’s created order. Such a formation process should be based on God’s faith, leading to unmasking earth pathological symptoms, identifying principles for change, laying strategies for transformation and finally drawing a vision of the earth-caring community based on *Ujamaa/Ubuntu* worldview, as it is drawn in the figure 3 below:

Figure 3: A framework for eco-moral formation: An earth-caring community



In this proposed framework, faith, Christian doctrines and Church traditions make a foundation for the formation of an earth-caring community based on the values of

Ujamaa [*Ubuntu*]. This means that Christian faith, Christian doctrines and church traditions becomes lenses (resources) of seeing the conditions and challenges facing the world community today (unmasking the ecological pathologies e.g. climate change and environmental degradation). The uncovering of ecological pathologies moves the community to the next level where principles for change are identified. For Christian community such principles will include, but are not limited to, honouring the integrity of creation, practicing responsible stewardship or creation care and promoting harmonious relationship with the entire *oikos* of God. Then strategies for transformation are formulated and put in place. Among these strategies are Christian discipleship and Christian eco-moral formation as well as advocacy, mobilisation, partnering with other organisations, etc. The three key values embedded in the *Ujamaa* metaphor [community, participation and inclusivity] have the potential to guide the implementation of these strategies (Cornelli, 2012:110).

In the whole the above proposed framework, as Korten (2006:313) would argue, aims at birthing an earth-caring community where all people are encouraged to “become the change that they seek in the world.” This is the community which chooses life and gives special respect to nature. In the context of Tanzania such a community should constitute the majority who sustain their lives through interacting with the natural environment i.e. farming activities. Therefore, due to the problem of climate change which affects agricultural performance, it becomes necessary to birth this community from below. Commenting on birthing an earth-caring community from below, Korten (2006:314) contends that “no problem can be solved from the same level of consciousness that created it.”

This means that the true transformation of human attitudes towards natural environment and much cultivation of an African ethic of care to enhance sustainable agriculture must be based on creating an opportunity for people to live the change which is required. The basic task of the framework will be to facilitate the birthing of the earth-caring community and to formulate “life-affirming values” which “restore to people, families and communities the power” to transform human attitudes towards the natural environment in which life-enhancing capacity is engraved (Korten, 2006:341). Msafiri (2012:44) has articulated ten values that can potentially result from the eco-moral formation leading to ethics of climate change. These values include “faith, hope, dignity,

solidarity and agape”. Others are those such as “accountability, care and compassion, transparency, sustainability and peace” for all. Together they constitute the central pillars and ethos of the faith-based model of climate change mitigation and adaptation, typically different to scientific models (Msafiri, 2012:44).

It is within such an earth-caring community, Jeffrey (2007:123) adds, where true and comprehensive moral attitudes can enhance moral responsibility of humankind towards one another, God and the rest of creation, because proper eco-moral formation requires such a wider communal context. This, in a long run, add Wadell and Davis (2007:142), will result in the reviving of the divine-given nature of human beings “to seek what is best, fashioned to hunger for what is true and good and beautiful. We are programmed to respond to the lure of goodness, and love and compassion” for the wider earth community.

This, according to Slaby (2009), concurs with the resolutions of the Earth Charter Summit, which, among other things, focused on the agricultural sector and proposed that farming communities should develop agricultural methods which respond to issues of climate change. The Earth Charter, argues Slaby (2009:25-30), lays down critical principles that are relevant in transforming current unsustainable farming practices that add to the problem of climate change. The three principles that must guide farming activities are: farmers should respect and care for the entire community of life, ecological integrity and social and economic justice while clinging to the common good of all. It is in this regard that Wadell and Davis (2007:143) have consistently argued that humankind and more especially Christian faith communities should be convicted that “lives devoted to service, compassion, justice, and goodness are better than lives centred on gratifying [destructive] whims of the self.”

In this way, adds Wirzba (2003:28-29), the traditional view that creation exists exclusively for humankind will be reversed. Human beings will learn to respect rather than destroy various gifts that the earth provides in support of all forms of life. Human beings will learn that it is irrational to destroy, deplete and irreparably harm “the sources upon which we clearly depend.” The realization that harming earth equals self-harm will increase. This will enlighten human beings to be aware that, divinely understood, human dominion must take into account ecological limits and be cognisant of what creation “allows and

recommends” (Wirzba, 2003:129). Ecological Christian formation is likely to lead to the recognition of humankind as responsible stewards. Etymologically, the term steward refers to “someone who supervises, administers and controls the affairs of the household with power and insights” and includes the ability “to ensure that the household does not come to ruin” (Wirzba, 2003:29).

On this basis, human beings are meant to be stewards of creation who recognise God as the master and owner of the creation and who know that their responsibility is to wisely manage and conserve rather than being irresponsible exploiters of the earth. Therefore, stewardship must be a central character of “human identity and vocation.” However, the notion of steward has had some ambiguities, especially relating to the hierarchical nature engraved in it. For it to be sufficient, it has to be coupled with the whole idea of citizenship ethic which is the central focus of the second Yahwist creation account where metaphors of tilling and keeping the earth is emphasized (Wirzba, 2003:133). Human beings are citizens of the earth who, like other non-human beings, are struggling and working to maintain life.

Coupled with the notion of citizenship is the idea of interpreting *imago Dei* as the image of the servant of creation. The framework proposed above has the potential to create such a worldview which recognises both human interdependence with the rest of creation and human uniqueness without turning it “into despotic exploitation” (Wirzba, 2003:135). This means that the relationship between human beings and the rest of creation should take a model of servant-hood. Therefore, servant-hood is a metaphor that shifts and transforms the traditional orientation of human “actions into the well being of others, ways of making room for others and finally to the praise of the Creator” (Wirzba, 2003:135).

Working within the ecological Christian and pastoral formation will potentially not only lead to the formation of the responsible stewards, citizens and servants of creation as articulated above, but also improvise and cultivate a culture of creation care. According to Wirzba, 2003:150), “the defining characteristics of the culture of creation care are its acknowledgement of the full range of interdependencies between humanity, creation and God and acceptance of responsibility for the wholeness of relations that exists among them.” Once such culture is in place, the likely result will be threefold: the promotion of

the integrity and health of the whole created order, fostering the conditions in which human responsibility for and care of creation will take place while enlivening the sense of delight in and gratitude for the gift of creation, i.e. economic activity will itself be a form of worship to God the Creator (Wirzba, 2003:159-160).

7.7 Chapter summary

This chapter has explored potential ways through which an African Christian ethic of care can be cultivated in response to climate change which the agricultural sector is both affected by and contributes to, thus promoting sustainable agriculture. Bearing in mind the fact that this cultivation can hardly happen without church involvement, after conceptualising an ethic of care, the chapter has argued that saving the soil [earth] is as of the same critical importance as saving the soul and the church should be cognisant of this reality. On this basis and given the current challenge of climate change, especially in relation to the world of agriculture, God's creation care and agriculture should be seen as a new mission frontier. It has been further argued that the recognition of the creation care and agriculture as a new mission frontier, calls for an ecological approach to mission (eco-mission) where the focus of mission is not dichotomised, but it is an all embracing type of mission which ensures the integrity of creation as well as integrity of life. In this regard, it has been argued that life-affirming agriculture (creation care through farming practices) must be seen as a Christian faith concern, a mission concern, a pastoral concern and a concern of Christian ethics as a whole. This calls for a critical review of the traditional Christian formation which is largely non-ecological formation and highlights the need to transform it into a more life-enhancing ecological Christian formation.

Instead of focusing Christian formation into doctrines, church tradition and the life hereafter (non-ecological Christian formation), a life-enhancing ecological Christian formation (discipleship formation) should view those doctrines and church traditions as resources for a holistic mission whose purpose is threefold: to strengthen Christian faith, to enhance Christian life and to consolidate a holistic Christian mission. This approach has the potential to set a base for a formation of an earth-caring community which is morally sound and capable of identifying earth pathologies, setting principles for change

and formulating strategies for transformation based on the African worldview engraved in the metaphors of *Ubuntu* and *Ujamaa*.

CHAPTER EIGHT

CONCLUDING OBSERVATIONS AND RECOMMENDATIONS

God dwells in heaven, he acts from heaven, and his will is done on earth as it is in heaven... God is present in human beings. He appears wherever human beings appear. The human being is God's indirect manifestation on earth (Moltmann, 1985).

8.1 Introduction

Gray (2006:123) has alluded that history is a valuable “education in preparation of what the future may bring.” On this basis, this study has endeavoured to explore the significance of an African Christian ethic of care in the world of agriculture and how it can be cultivated in order to counter the adverse impact of climate change and the environmental degradation that threatens all forms of life today. Chapter eight of this study offers an overview of the study and its conclusions, while extracting some key insights resulting from the research findings. The chapter is presented in three sections. The first section lists key insights that this study has provided. The second part briefly highlights the contribution that this study makes to the total body of knowledge dealing with its subject matter, namely climate change, agriculture and Christian theological ethics. The third section identifies the limitations of the study and suggests potential areas for further research.

8.2 Postulating the thesis of the study

Climate change concerns people of all walks of life. In this regard, protecting the poor and safeguarding the integrity of life, and of creation as a whole, is a critical imperative for humankind. Thus, the research question that this study has attempted to address is: *In what ways can an African Christian ethic of care be cultivated for sustainable agriculture in the context of climate change in Tanzania?* An attempt to address this question has been carried out in the following manner. The process of deciding on a theoretical and methodological orientation suitable for the study has been outlined in chapter one of this study. Principally, qualitative methods were used because of the inductive nature of the study, as

described in chapter one of this study. These methods provided the researcher with the opportunity to delve for the deeper meanings of particular phenomena and to develop the sensitising concepts needed to address particular concerns of the study. Qualitative methods are usually associated with interpretive perspectives and help to develop an understanding of the meanings that people ascribe to the world around them. Also these methods help to identify ways in which these meanings govern humankind's behaviour, attitudes, intentions and actions, as well as their interactions with their surrounding environment (Henn, Mark and Nick, 2006:150). Such methods are appropriate for the current study as underlying the question of climate change are issues of people's perceptions of and attitudes towards the universe or, in short, their worldview pertaining to key issues of interest to the study, namely: climate change, the world of agriculture and Christian ethics.

On the basis of the qualitative methods, used in combination with theory of ecological transformation, chapter two has briefly presented the setting or the context of the research, namely Tanzania, where issues of climate change, the world of agriculture and the church have been discussed. In this regard, the current states of climate change and factors that contribute to climate change have been brought to the fore. It has been pointed out that in the context of Tanzania climate change and the world of agriculture are closely related. Since agriculture is the dominant economic activity in Tanzania, unsustainable methods of agriculture which do not take into account the health of the natural environment have in the past and currently continue to contribute greatly to climate variability. Although climate change in Tanzania, as it is in other parts of the world, is real and its impact in the world of agriculture is evident, the role of the church has remained ambivalent, with hardly any attempts to engage with the situation and to promote life-centred agricultural activities.

In chapter three, the study exhibited further the conceptual link between climate change and agriculture by demonstrating the interplay that exists between the two intertwined aspects of this study. The significance of the agricultural sector for sustaining life on earth is discussed, with special relevance to Tanzania. It is argued that agriculture is both affected by climate change but also contributes significantly to the problem of climate change. On one hand, modern approaches to agriculture such as monoculture, deep tillage, agrochemical concentration, etc., have affected the natural functioning of

ecosystems leading to climate variability. On the other hand, manipulation of the natural functioning of ecosystems and high levels of climatic variability affect agricultural production and seriously endanger life on earth.

Chapter four sought to articulate the relationship between climate change, agriculture and theology. The study has pointed out that the adoption of modern agricultural methods that are detrimental to God's created order which supports agricultural production and life in general, is informed by a particular worldview. This worldview, to a significant degree, has been inspired by Western Christianity. It is argued, therefore, that theology is part of both the problem and the solution of climate change and environmental degradation in relation to agriculture. It is part of the problem because theological thoughts largely tended to take an anthropocentric point of view, therefore nurturing a worldview and human attitudes that position humankind over and above God's creation. This became evident when missionaries introduced Christianity in Africa and downplayed indigenous knowledge about ecosystems and their capacity for sustaining life on earth. This, in turn, created an attitude in human beings which led to the uncritical acceptance of modern technology and science and to the plunder of God's creation.

On the other hand, theology has the potential to be part of the solution, especially if it would embark on theological reflection of a holistic and less anthropocentric nature in order to transform the current dominant worldview and human attitude. With regard to promoting life enhancing agriculture, biblical metaphors such as tilling and keeping the earth open up possibilities for offering an agro-theological response to the need for more sustainable farming practices, thus reducing the agricultural contribution to the problem of climate change.

In chapter five, this thesis moves from the problematising of theology and from current agricultural approaches, discussed in chapters three and four, towards providing some insights on African Christian agro-moral-theological vision as a theological response to issues of climate change in relation to the world of agriculture. In the first place, the study made an attempt to discern moral-theological implications of climatic problems. In this regard, it has been argued that the moral-theological dimension of climate change is exhibited by the fact that climate change threatens the well being of all creatures, at present and in the future; threatens sustainability of life on earth and raises a question of

justice, especially relating to people who are at the margin of society. Given these moral-theological aspects of climate change, it has also been contended that the existing Christian ethics is insufficient to address these issues due to its Western oriented and anthropocentric nature. In the light of this, the study has suggested that the re-envisioning of Christian ethics is imperative in which divine vocation to care for creation must be redeemed; re-interpreting eco-dominion theology and reclaiming African cosmovision (worldview) are taken into account.

African Christian agro-moral vision, as discussed in chapter five, needs to be deeply rooted in the African soil. Therefore, African indigenous ecological knowledge has been explored in depth in chapter six, leading to the identification of potential aspects for advancing an agro-moral vision of tilling and keeping the earth, in the context of climate change. It is argued that in the light of the threat posed by climate change, it is feasible for scientific and indigenous knowledge to collaborate for the sake of creating a life-centred agriculture. In the context of Africa, and Tanzania in particular, such a coming together of indigenous and scientific knowledge should be informed by Christian cosmic spirituality which allows human beings to see that they are part and parcel of creation and carry a special responsibility for it. The contributions made by theology and by indigenous worldviews would lead to humankind recognizing God's creation as an organism in which all things are interrelated and this awareness would reinforce the covenantal relationship between God, nature and humankind.

Having outlined the potential of combined scientific and indigenous ecological knowledge for the promotion of a life-centred agriculture in the previous chapters, chapter seven of this study turns towards a discussion of ways in which an African Christian ethic of care can be cultivated to enhance sustainable agriculture in response to the problem of climate change. It is argued that such cultivation does not represent a one-off event but a process. The starting point in this process, from the Christian's viewpoint, should be the acknowledgement that the church mission needs to recognise care for the creation as its new mission frontier and consider advancing sustainable agriculture as a matter of faith, church mission, and Christian ethics. Therefore, in order to help transform the current anthropocentric outlook of humankind, Christian mission needs to be revisited and transformed. The current study proposes some key areas to which special attention must be paid if human attitudes towards God's creation are to

change. These include Christian formation in general and Christian moral formation in particular.

Regarding Christian formation in general, the study argues that, in the context of climate change and in order to promote a sustainable agriculture, the traditional Christian formation focusing on imparting doctrines, traditions and other worldly perspectives (see figure 2) needs to be replaced with a life-centred, ecology-based African Christian formation. In this approach to Christian formation, doctrines and other traditional material ought to be treated as the foundation or resources rather than as a goal of Christian formation (see figure 3). The goal of Christian formation then becomes threefold, namely strengthening the Christian faith, enhancing Christian life which is a life of responsibility, and consolidating Christian mission that goes beyond saving the human soul.

Regarding Christian moral formation, the study has suggested that the vision of Christian ethics should be directed towards the formation of an earth-caring community which can potentially enhance sustainable agriculture, leading to a life of abundance for all. A framework of four stages is proposed for the realisation of this vision. In the foundation stage, Christian doctrines, tradition and faith are presented as the theological motivation for taking care of God's creation, in general, and for adopting sustainable agricultural approaches, in particular. In the next stage, Christians are enabled to recognise the conditions of the earth (climate change, environmental degradation etc). Having become aware of the condition of the earth, in the third stage Christians are motivated to identify principles for change and the fourth stage involves establishing strategies for transformation.

8.3 The study's contribution to the body of knowledge

From the outset this study sought to make a significant contribution to the current debate on climate change, sustainable agriculture and Christian ethics. The contribution made by the study fits into five categories.

As has been demonstrated throughout the study, climate change has harmed and continues to harm various forms of life on earth. Although this is true for the entire

world, the situation is rapidly getting worse in developing countries such as Tanzania where there is an urgent need to take measures to limit the damage done to nature. The current study has made a special contribution to relevant knowledge in the context of Tanzania where agriculture is the backbone of the national and the individual economy and where the Christian faith has been present for more than a hundred years without devoting much in the way of moral-theological reflection to life-affirming farming methods, the need for which has become urgent in the last few decades. Therefore, as a first contribution, the study has opened up a fresh perspective on general theological reflection that goes beyond the traditional ways of doing theology. The study has stimulated a new theological reflection on current issues of endangered life forms on earth. It has opened a new avenue for theologians in Tanzania and elsewhere to engage in addressing the acute problems of the 21st century such as climate change and environmental crisis particularly in the world of agriculture.

A second contribution, made by this dissertation, concerns its theoretical underpinning. Three principles of ecological transformation (unmasking earth pathologies, deepening ecological awareness and renewing the human psyche) and the theory of responsibility have guided the discussion throughout the study. Based on this theoretical orientation, a particular framework was proposed through which an earth-caring community, or a responsible community, can be formed in a specific context such as Tanzania. In this framework, Christian faith, doctrines and traditions are seen as basic resources and therefore as a foundation for an earth-caring community, especially in the world of agriculture. Embedded in these Christian aspects is the possibility that humankind's eyes will be opened to see the ecological crisis that global and local communities are facing. Once this foundation is in place, according to the current study's proposed framework, principles of change need to be identified followed by defining strategies to facilitate change in people's minds, behaviours, attitudes and actions. At the centre of the current proposed framework is the promotion of abundant life for all in God's household (see figure 3).

A third theological contribution made by this study is the call for placing life abundance at the centre of church mission praxis, especially in the Tanzanian context. Placing life abundance at the centre of mission praxis means that enhancing life has to be the key principle that drives church mission agenda. Any church, guided by this principle, will be

able to awaken humanity on the fact that the plunder of God's creation deprives many creatures from accessing healthy life resources. In this process, humankind will gradually be convinced of the necessity to safeguard the integrity of God's creation and to give ecosystems a chance to regenerate so that they will continue to function fruitfully for the benefit of the entire creation. Once the theology of abundant life characterises human and church's praxis, it will stimulate the awareness that the natural environment, economic (farming), political, social and spiritual dimensions of life are all interconnected and that respect for this interconnectedness can potentially forge a new ethic, derived from a new perspective, namely an ethic of life, care, precaution, solidarity, responsibility and compassion.

The theology of life's abundance is based on the Christian belief that God is a God of life and that He is concerned with the integrity of life and its sustainability. Therefore, the human recognition that life in all its forms belongs to God is a declaration of faith in life and hence will lead to a resistance against forces of death and destruction, including environmental destruction through farming practices. The declaration of faith in life tallies with the article in the Nicene Creed that affirms and recognises the Holy Spirit as a giver of life. If a theology of life's abundance would guide the mission of the church and human relationships to God's created order, worldviews and attitudes of humankind towards the natural environment will potentially be transformed.

The fourth contribution made by this study is interdisciplinary in nature whereby 'tilling and keeping the earth' has been newly interpreted as an agro-moral-theological metaphor that can potentially enhance sustainable agriculture, compatible with safeguarding the integrity of the creation, in general, and the integrity of life system on earth, in particular (farming God's way). This agro-moral-theological metaphor indicates that fertile soil is a gift entrusted to human beings by God. Inherent in this metaphor is also the suggestion that a sustainable human relationship with the soil is evidenced by human practices of food production (farming) as well as consumption. This is of critical importance for all aspects of human life. The current thesis presents a possible interface between theology and agriculture, thus adding a new aspect to ecotheology, with a specific focus in the world of agriculture as a particular facet of human interaction with God's created order. This approach is based on what Ellen F. Davis (2009:4) calls an agrarian understanding of the scripture. Agro-moral-theological reflection (allowing agriculture, ethics and

theology to speak to each other), will gradually lead to the realisation that humanity is created in order to have a positive, sustainable and life-enhancing interaction with God's created order where all the resources necessary for its existence and survival are obtained. Tilling and keeping as agro-moral-theological metaphor, in view of this study, may not offer an abrupt solution to the climate change problems, but provides specific vision and principle informed by modern science and traditional patterns of thoughts, values and new practices which will lead to the healing of the earth.

Another point, signalling the fifth contribution made by this study to the debate on climate change, agricultural practices, and Christian ethics falls under Christian ethics. Throughout this study it has been frequently mentioned that climate change demonstrates careless treatment of God's creation by humankind. Moreover, it has been pointed out that existing dominant ethical theories (deontology, teleology and virtues) are not rooted in practical, daily life experience; rather, they are deductive and abstract in nature. Therefore, they are inadequate guides for human behaviour and for human's attitudes towards God's creation.

Drawing on feminist perspectives, especially the metaphor of care, this study extends ethical theoretical boundaries, by arguing that since an ethic of care is rooted in real life experiences, it can, therefore, potentially transform humankind's attitude towards nature. More importantly, in the African context such an ethic of care has to be embodied by the notion of *ubuntu*, and of *ujamaa* in the context of Tanzania. Therefore, an African Christian ethic of care that draws its wisdom from these concepts is likely to be able to facilitate the establishment of an earth-caring community that reaches beyond human boundaries and that respects and enhances harmonious holistic relationships, involving protection of the integrity of life and creation, leading to a meaningful existence on earth.

8.4 Limitations and recommendations for further research

This study has, without being exhaustive, integrated key areas of climate change, agriculture and Christian ethics. In particular, the study concentrates on the exploration of ways in which an African Christian ethic of care can be cultivated in order to enhance sustainable agriculture in the context of climate change in Tanzania. However, during the course of the research, a number of related issues have emerged that are beyond the

scope of this study but that open up possibilities for further research, particularly in the Theology and Development programme. These issues are outlined below:

First, in the course of the current research, it became clear that a number of studies have been conducted on environmental ethics and on Christian environmental ethics, as well as on environmental theology. However, very little has been said regarding agricultural ethics, especially African Christian agricultural ethics. This is an area that needs to be explored and developed due to the fact that ethics is a crosscutting concept. If much has been done in areas such as business ethics, ethics of health care, professional ethics, etc., it seems natural that, in the context of climate change, Christian faith communities should develop ethical principles that can guide them in their interaction with God's creation, specifically through agricultural production.

Second, although this study has proposed that climate change calls for the formation of an earth-caring community, it was beyond its scope to articulate in more detail, how the vision of an earth-caring community can be realised. This creates another potential area for further enquiry from the Christian faith perspective, and especially by drawing on insights gleaned from the African concept of *Ubuntu/Ujamaa*.

Third, there is a need for a more detailed survey of African indigenous ecological knowledge and its usefulness for the addressing of issues of climate change and environmental degradation incorporated into theological discourse.

Fourth, further research is needed to determine in which manner such knowledge can partner or intersect with scientific and theological knowledge in order to promote the introduction of life-enhancing agriculture and to provide a comprehensive, practical approach to challenges of climate change, especially in the context of Tanzania.

Fifth, in the course of this study, especially in chapter 4, it became evident that the impact of climate change does not affect men and women in the same way, especially in rural communities. This raises the need for further inquiry that will lead to a more gendered theology of climate change to promote women's experiences and contributions towards mitigating the effect of climate change.

Sixth, chapter two and three of this study alluded to the Kyoto protocol and UNFCCC as global policies that govern efforts towards curbing challenges of climate change. Although individual countries have developed policies and some legal frameworks based on the global policies, in this study it has been clear that theological reflections that influence climate change policy formulation and legislation have hardly been noted, thus creating another potential area for future study.

Lastly, chapter three of this study highlighted various impacts of climate change, among others, on human health and well being. Since it was beyond the scope of this study to explore in greater detail how climate change affects human health, this appears to be another potential area for future study where theological reflection can be carried out along these lines and how this connects with the world of agriculture.

8.5 Conclusion

As has been demonstrated throughout this study, climate change has posed and continues to pose a serious threat to all forms of life on earth, thus marking the demise of the gospel vision of abundant and quality life for all. Irresponsible use of modern technologies that cuts across all sectors, especially the agricultural sector, stands to be the major cause of the environmental problems and climate change today. Moreover, climate change and environmental crisis are also religious issues, in this case relating to Christianity, with its anthropocentric nature. Theories of ethics that influence Christian ethics – teleology, deontology and virtues - continue to give priority to humankind while disregarding the rest of creation. Some of the aspects of the indigenous knowledge which are environmentally sensitive have largely been marginalised and the Christian formation has mainly focused on doctrines, traditions and other worldly perspectives. Similarly, the mission of the church has been concerned with the salvation of humankind rather than the creation as whole. In this regard, the present study proposes a transformed, inclusive and comprehensive Christian formation which is grounded in the faith, doctrines, and traditions. Therefore, the message of climate change to the church in Tanzania, and elsewhere, is that in order to address challenges brought about by climate change and to be able to cultivate an African Christian ethic of care for sustainable agriculture, care of God's created order must be seen as a new frontier for mission and Christian formation,

pastoral formation as well as Christian moral formation must be comprehensively done while embracing the African metaphors of *Ubuntu* and *Ujamaa*.

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APPENDICES

Appendices 1 Ethical Clearance Letter



31 October 2012

Rev Gabriel Ezekia Nduye 210524790
School of Religion, Philosophy and Classics
Pietermaritzburg Campus

Dear Rev Nduye

Protocol reference number: HSS/1153/012D

Project title: Climate change and Agriculture: incarnating an African Christian ethic of care into farming practices in the context of climate change in the Southern Diocese (SD) of the Evangelical Lutheran Church in Tanzania (ELCT).

Expedited approval

I wish to inform you that your application has been granted Full Approval through an expedited review process.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Professor Steven Collings (Chair)

/px

cc Supervisor Dr Clint Le Bruyns
cc Academic leader Professor P Denis
cc School Admin. Mrs C Murugan

Professor S Collings (Chair)
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Footing Campus: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

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Appendix 2: Turnitin Report

Turnitin Originality Report

Title: **Sustainable Agriculture in the Context of Climate Change in Tanzania?**

On cultivating an African Christian Ethic of care

By

Gabriel Ezekia Nduye

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