

CHAPTER ONE

1.0 Introduction

God created the world in such a way that everything in it is related. All physical elements and organisms are purposefully related in the ecological systems such as marshlands, forests, grasslands, the rivers and oceans, besides the planet earth (Klein, 1989). As such, when any element of ecology is abused the effect is passed on to the other elements and to the entire ecosystem. The Catholic Church has in the theology of *imago Dei* ecological ethics which can help to revalue the ecology.

Santmire (1985) and Wakarega (2009), however, demonstrate that Christianity had no elaborate ecological scheme in its history. McDonagh (1986) criticises the Catholic Church for not strongly addressing anti-ecology effects of industrialisation in her principal documents prior to and in the immediate aftermath of the Vatican II council.

Dyer (1975) nonetheless, shows that Christianity commands a central role in the formulation of worldviews that would orient humanity towards ecology. Christianity provides the world with means of recognizing humans' limitations in ecology and challenges them to undertake ethical and theological practices that would effect self transformation and communal communion with ecology.

The Pope's letter to the world for Peace Day, 1st January 1990, entitled "Peace with all creation," was exclusively dedicated to ecological concerns (McDonagh, 1990:190). In this document, Pope John Paul II noted the Church's stewardship role and named ecological problems in greater detail than in any previous documents which remained largely philosophical and theological. The Pontiff spoke of the depletion of the Ozone layer, deforestation, and greenhouse effect,

destruction of marine life, soil erosion, acid rain and waste of resources on armaments. He outlined the root causes of ecological degradation.

Pope John Paul II commented on the erratic application of scientific and technological advances to ecological problems. He further cautioned that modern society would have no solution to ecological problems unless it reviews its life-style.

Pope Benedict XVI reaffirmed the Catholic Church's stewardship role in ecology in the encyclical *Caritas in Veritate*. This disposition has been re-echoed by renowned Catholic Scholars in the recent past. Berry (1999) argues that the planet cannot support its human presence unless there is a reciprocal human support for the life systems of the planet. The need to develop a complete different range of ecological responsibility is long overdue.

Exploitative use of natural resources and irresponsible attitudes towards ecology are threatening the life supporting climate on planet earth thereby persistently intimidating the sustainable future of the natural world and humanity. Mulongo et al (2010) observe that the economic approaches, modern agricultural practices, poverty, urbanization and technological and scientific advancement support ecological degradation.

From the perspective of the Environmental Council of Zambia (2001) liberalisation of the Zambian economy has influenced the rate of ecological degradation in Zambia, in that high electricity tariffs and the reduction of the fiscal support to the forestry department heightened the deforestation levels. Besides, the economic emphasis on agribusiness has introduced the use of mechanised commercial farming which uses chemicals which are hazardous to ecology (*ibid*). The modern approaches to agriculture respond to the dictates of the market. Hence they are not structured to sustain the environment and mitigate poverty (Brown, et al, 1989).

According to the Environmental Council of Zambia (2001), poverty is one of the key dangers to ecology due to over reliance of the poor on the natural resources. Alongside the increase in poverty, is rapid population growth which the World Bank (1984) reports to be moving into urban areas especially in third world countries such as Zambia.

Lusaka, like other urban areas in Zambia, is unable to contain the social and economical demands of its population as the provision of social amenities such as water and sanitation besides energy does not correspond to the increase in demand (Environmental Council of Zambia, 2001). The city of Lusaka has seen the mushrooming of unplanned settlements as the poor are pushed on the peripheral of its economic and social confines hence exerting undesirable pressure on ecology.

Critics like White (1967) blame Christianity for its anthropocentric teaching, which emphasises human dominion over the natural world, and see it as detrimental to ecology. Burns (1992), Boff (1995), Cheyeka (2006) and Namafe (2006) show that enlightenment philosophers invented the modernity scheme which encouraged humanity's dominative attitude over the earth. Enlightenment philosophers proposed a paradigm shift in man's relationship with the natural world (*ibid*).

This study assessed how the ecological teachings proposed by the Catholic Church's leadership and Scholars have effectively influenced the role of the Church in ecology. This research was carried out at Kasisi Agricultural Training Centre and attempted to show that the theological and moral imperatives proposed in the Catholic theology of *imago Dei* can help to revalue the ecology. The researcher proposes that the moral imperatives of the theology of *imago Dei* should be integrated in the context of the concerned.

1.1 The background of Kasisi Agricultural Training Centre

Kasisi Agricultural Training Centre (KATC) is situated seven (7) Km North-East of Lusaka International Airport. KATC is owned by the Jesuits. As such it is a faith based agricultural training centre which was established in 1974 to specifically train small scale farmers. Initially the Centre offered a two-year family residential programme. This programme, enabled families to purchase oxen and other farm implements from their produce's profits. Conventional farming methods were taught and extension services were offered to the graduate families (KATC presentation, Agricultural and Commercial Show, 2010)

Changula (2008) shows that like the Ministry of Agriculture and Co-operatives, KATC faced some challenges in its operations which included:

- i. outdated agriculture training material
- ii. insufficient training for instructors in modern and changing agricultural trends
- iii. insufficient information and skills in modern agricultural technology
- iv. orientation to conventional as opposed to organic agriculture
- v. lack of integration of indigenous knowledge

The current KATC strategic plan has responded to the afore-mentioned operational challenges by adopting the philosophy of promoting sustainable social and economic growth through organic environmentally friendly technologies and practices (*ibid*). KATC has since embraced the vision of being a leading training institute in organic agriculture so as to facilitate holistic rural development. Therefore, KATC's mission is to empower rural communities to improve their livelihoods through research, training, extension, co-operative development and market linkages (*ibid*). The problems being addressed by KATC include small scale farmers' agricultural production, high food insecurity, unpredictable rainfall patterns, environmental degradation,

rural poverty, and decreased soil fertility. KATC (www.miseancara.ie/rural-rural-development-brother_paul_desmarasi) has noticed that

Young people are shying away from farming because of the perceived high cost (especially of inorganic fertilisers), and women farmer's health, especially those living with HIV/AIDS, is being damaged by chemical fertilisers. The main aim of this project was to increase agricultural production in Zambia and to contribute towards the improvement of the living standards of the Small Scale Farmers (SSFs) in Chongwe and other districts.

Since 1990 KATC has been engaged in various sustainable agricultural activities such as offering training to SSFs in a variety of organic and sustainable agricultural practices which include biological pest management, vegetable production, animal traction and management and agro forestry, farm management, agri-business management, bee keeping, blacksmithing, organic cotton production, study circle leadership, permaculture design and dairy and pastures (KATC presentation, Agricultural and Commercial Show, 2010).

KATC also offers extension services to small scale farmers. SSFs who have undergone training at KATC are given follow-up technical guidance and counsel. Extension work incorporates methods such as the use of field days, Radio programs, follow-up household visits and Demonstration plots (*ibid*). About 30 demonstration plots on sustainable and organic agriculture are arranged every rainy season. Field days are organized and held in February and March at designated demonstration plots.

As from 2001, KATC in collaboration with Yatsani community Radio airs a programme on sustainable and organic agriculture. In addition, the institution prioritizes research. KATC

researches on organic and sustainable agricultural techniques. Under this department, verification trails for both indigenous and exotic technology are conducted (*ibid*).

KATC is working with about 1,200 Small Scale Farmers (SSFs) (*ibid*), training them on conservation farming, agro-forestry and organic production. The institution is looking forward to working with the Ministry of Education to further organic farming in schools in Zambia (www.miseancara.ie/rural-rural-development-brother_paul_desmarasi). The KATC project on sustainable and organic agriculture depicts the theological and moral imperatives of the theology of *Imago Dei*. The Catholic International theological Commission (2009) explains that the theology of *Imago Dei* reaffirms the truth that human persons are created in the image of God in order to enjoy personal communion with the Father, Son and Holy Spirit and in order to exercise, in God's name, responsible stewardship of the created world. In the light of the theology of *Imago Dei*, Flannery (1964) shows the Catholic Church's ecological disposition of stewardship and communion.

As a Jesuit apostolate, Kasisi Agricultural Training Centre is guided by the Catholic social teaching which is animated by fundamentals of the theology of *Imago Dei*: creation is basically good, human dignity in ecology is inalienable, human beings are stewards of ecology and natural resources are a common good which manifests the glory of God and should be used with respect and care. Under this gist, KATC has been developing a close link between social justice and eco-justice in its quest to promote sustainable agriculture and care for the environment (www.kiwi-us.com/news). Kasisi Agricultural Training Centre, therefore, was an ideal study site for this research.

1.2 Statement of the Problem

There has been a noticeable increase in proclamations made by Catholic Church leaders and scholars on the role of the church in ecology. In spite of this discourse, little has been done to investigate the implementation of these teachings. Considering that there is an increase in ecological degradation in Zambia and the world at large, this study, endeavoured to assess the effectiveness of the Catholic Church's role in ecology.

1.3 Purpose of the study

The study aimed at assessing the effectiveness of the role of the Catholic Church in ecology in the Zambian context.

1.4 Objectives of the Study

The objectives of the study were as follows

1. To investigate the effectiveness of the Catholic Church's role in ecology in Zambia
2. To find out whether the present Catholic Church's ecological content and approaches are adequately accessed and understood by KATC's small scale farmers
3. To suggest some strategies that would help in the implementation of Catholic Church's ecological proclamations

1.5 Research Questions

The study attempted to provide answers to the following research questions based on the research objectives:

1. How effective is the Catholic Church's role in ecology in the Zambian context particularly at Kasisi?
2. Is the Catholic Church's ecological content and approaches adequately accessed and understood by KATC's small scale farmers?

3. Are the past trainees of Kasisi Training Centre actively involved in the Church's role in ecology?

1.6 Significance of the Study

The study is significant because it is the first of its kind in Zambia which showcases a faith based institution's involvement in the preservation of nature. In doing so, the research challenges those who claim to be Christians to re-assess their role of stewardship. From the academic point of view this research contributes some knowledge to eco-theology or green theology.

1.7 Definition of Terms

In this dissertation

Imago Dei: a Catholic theology which reaffirms the truth that human persons are created in the image of God in order to enjoy personal communion with the Father, Son and Holy Spirit and in order to exercise, in God's name, responsible stewardship of the created world (The International theological commission, 2009).

Ecology: refers to the relationships, and interactions between organisms and their surroundings. It includes all non-living and living creatures ranging from elementary to complex forms of life besides culture and society (Boff, 1995).

Jesuits: denotes members of the Society of Jesus a religious congregation of Priests and Brothers in Catholic Church which was founded by Ignatius of Loyola.

Food Security: access to all people to enough food for an active and healthy life (Nutrition and household Food security in Farming Systems Research, 1992)

Sustainable Agriculture: a food system that (a) provides a reasonable rate of return to farmers, to sustain farm families, agriculture infrastructure and rural communities; (b) assures a reasonable rate of return to public and private providers of farm inputs, information, services and technologies; (c) preserves and generates soil, water, biological resources upon which farming depends; (d) avoids adverse impacts on the natural environment, increases productivity and per-hectare yields at least in step with the growth in demand and (e) adheres to social norms and expectations in terms of fairness, equity, compliance with regulations, food safety and ethical treatment of workers, animals and other creatures sharing the agriculture landscape (Benbrook in Lubozhya, 2002)

Organic Agriculture: an agricultural system which does not use artificial chemicals in the production of plants and animals for food

Encyclical: means Roman Catholic Church letters sent by the Pope to all Catholic Bishops and the Catholic populace.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter looks at assorted literature discussing the role of the Catholic Church in ecology besides critics of Church's inactive participation in ecological degradation alleging that Christianity has encouraged the annihilation of ecology. It also displays the consequences of ecological degradation as perceived from the global and local setting, besides proposes the Catholic theology of *imago Dei* as a sound theological, ethical and moral conceptual and attitudinal frame work for ecological revaluation in Zambia.

2.2 Ecology: The neglected area of Catholic Church Pastoral Ministry

To date volumes have been written and said about ecology in the Catholic Church. Caldecott, (<http://conservation.catholic.org/caldecott.htm>) calls Pope John Paul II as the 'Green Pope' because of his authoritative statements on the importance of ecological concern as an integral element in the Catholic Social teaching. Pope John Paul II, in the January 1990 message for the World Day of Peace, devoted the document on Green Catholicism in which, he insisted that the new ecological awareness, "rather than being downplayed, ought to be encouraged to develop into concrete programs and initiatives." He encouraged "carefully co-ordinated solutions based on a morally coherent world view," (*ibid*) The Vatican has insistently cautioned Catholics to guard against new forms of social sins such as causing environmental degradation (www.vatican.va)

In the Apostolic Letter *Tertio Millennio Adveniente*, November 1994, Pope John Paul II wondered if Catholics really know and implement the principles of the social teaching of the

Church. The Pontiff's call for Catholics and Christian involvement in the mitigation of ecological degradation has received negligible attention among the Catholic populace in third world countries like Zambia. Apart from a few dotted ecological projects at some parishes which are generally taken up by individuals, the Catholic Church in Zambia does not have an elaborate program of action concerning ecology (Father Chiti, 2010).

The Catholic Church in Zambia rarely addresses aspects of ecological degradation. Some parishioners at Roma Parish, Lusaka re-echoed Boff's (1995:56) observation; "ecology is a problem of the Western world." Lesseps's (2002:29) hypothesis on approaches to poverty and environment: "developed countries tend to emphasize the need to preserve the environment and the developing countries tend to emphasize poverty eradication," proposes the attitude of the Catholic Church in the developing countries like Zambia towards ecological degradation. Apparently the Catholic Church in Zambia has not adequately addressed social, economical and political elements which impact negatively on the ecology.

The world's population is progressively moving into urban areas, particularly in developing countries (World Bank, 1984:358-431). Zambia has a long history of rural-urban migration which dates back to the colonial era (Chenje, 2000). By 2000 more than fifty percent of the Zambian population was urban based, making the country the most urbanized in the sub-region (*ibid*). Many people have migrated to the urban in search of employment and improved social amenities.

The progressive upsurge in population coupled with increased industrial activities has increased the demand for fresh air and water. Consequently, critical resources like fresh water and air are diminishing in quantity and quality (Klein, 1989). By the year 2000 Lusaka on the average

pumped 185,629ml of water per day against the demand of 288,630ml per day for a population of about 1.2 million (Environmental Council of Zambia, 2000).

Furthermore, the pace of population growth has accentuated demand for raw materials, housing and space for industries thereby encouraging an irreplaceable reduction of flora and fauna (Klein, 1989). Rapid population growth has put pressure on flora and fauna life as the ecosystems of the earth are pushed to the limit (Klein, 1989, World Bank, 1984). Many societies are demanding more from the Earth's resources and affecting the ecosystem at increasing rates (Pickering and Owen, 1995). This phenomenon has given rise to the depletion of non renewable natural resources, social injustice and deterioration in the quality of life (Klein, 1989). Some species of flora and fauna, consequently, fail to adapt to change brought about by industrial discharge and spillage in their environment (Environment Council of Zambia, 2001).

The Environment Council of Zambia (*ibid*) observes that Industrial activities particularly mining, uses and pollutes high volumes of water. According to the Environmental Council of Zambia (*ibid*), the Kafue River shows high concentrates of dissolved copper and cobalt within and down stream mining area. While, the frequent crude oil spills at Indeni Oil Refinery and the Tanzania, Zambia Authority (TAZAMA) Oil pipeline not only destroys vegetation and life but of great concern is the spills' potential to induce cancer-causing poisons into surface and underground water (*ibid*).

Apparently, owing to high population and increase in industrial activities, cities use huge quantities of natural resources and disposes off enormous waste. In the long run, cities produce environmental hazards which endanger the lives of inhabitants locally and globally (Mulongo et al, 2010). In the Urban areas of the Copperbelt Province of Zambia, Mining and industrial

activities are the main contributors to pollution. Mine effluent pollution arises from liquids which are discharged into water systems (Silengo and Sinkamba, 2006).

Silengo and Sinkamba (*ibid*) explain that the quantity of effluent discharge into water systems have shown to exceed Zambian and international effluent guidelines regarding total suspended solids for total copper and total cobalt. Mining Companies financed by the European Investment Bank such as Konkola Copper Mines (KCM), Mopani and Bwana Mkubwa have been granted indemnities for environment infringements some of which will end in 2020 (*ibid*). This shows a lack of responsibility for humanity as concern for the human community can only be fulfilled by a concern for the integrity of the natural world (*ibid*).

Mining companies, in addition, uses huge pieces of land. Communities within the companies' areas of operation usually have little or no land to access (Hallow and Munnik, 2008). In Neganega area, Mazabuka District, The Post, March 28, 2007, reported a land dispute between Albidon Mine and the local community over the company's acquisition of an extra 2,100 hectares of land. While in Solwezi District, Lumwana mine which has won Government support for upholding labour laws and regulating pollution levels, is reported to have progressively degraded a forest reserve so as to access more land (The Post, August, 9, 2007), thereby encouraging desertification. Like in Zambia, ecological irresponsibility is manifest in the other third world countries. In most of these countries the Catholic Church has considerable moral and religious influence.

2.2.1 Ecological responsibility in the third World: Africa

African governments do not treat desertification and other effects of environmental degradation as a priority items (Timberlake, 1994). Guy Scot (The Post, December 15, 2010) comments that blaming the developed countries and expecting them to take action to look after us may be good politics but not good for resource management. Some African leaders blame the rich nations for adding climate change to the series of Africa's problems.

During the 2007 African Union summit, Yoweri Museveni of Uganda declared climate change an act of aggression by the rich world against the poor nations and demanded for compensation (www.economist.com/world/Mideast/displaystory.cfm) A University of Pretoria study approximates that Africa may suffer the lose of \$ 25 billion in crop failure because of rising temperatures and \$ 4 billion from the reduced amount of rainfall (*ibid*). Some refer to the Darfur region of Sudan as proof of the damage of climate change, soil erosion and overpopulation. According to *The Economist*, few Africans leaders understand the scale of the challenge posed by climate change (*ibid*).

Nigeria has failed to curb the high level of dreadful pollution in the oil-producing Delta region and to prevent the acceleration of desertification in the Muslim north (*ibid*). According to the World Meteorological Organisation, the weather-data collection is incapable of meeting the demand for accurate weather data as most of the African weather station have fallen in disrepair (*ibid*). The African Union and the Catholic Church have shown negligible commitment to address ecological degradation.

While Museveni's observation; climate change is an act of aggression by the rich world against the world's poor, noted during the 2007 African Union Summit is correct, the continent should

not wait for donor assistance to conserve and protect the environment. With the moral and theological guidance from religious bodies like the Catholic Church, Africans should become responsibly proactive in matters of ecological reevaluation. Timberlake (1994) shows that about 6.9 million square kilometers of sub Saharan Africa are under direct threat of desertification. This ecological irresponsibility can be attributed to the dissonance between poverty and technological advancement (Cheyeka, 2006) which is driven by the precepts of capitalism.

Cheyeka (*ibid*) explains that Africans are conscious of how the western world destroyed it's habitat due to scientific sophistication which enhanced advanced technology, which in turn has contributed to ecological degradation. Despite this observation, most African nations are in hurry to use western technology to develop. Meanwhile, their state of deprivation makes them incapable of containing the effects of technological advancement on the ecology.

The World Resource Institute (1996-97) studies on industrialization in developing countries reports that the absences of specific regulatory policies and monitoring mechanisms will encourage a significant increase in pollution and that global emissions of green house gases will increase. This phenomenon will hasten the risk and prospective impact of global climate change. Undoubtedly Ecological degradation like Acquired Immune Deficiency Syndrome (AIDS) affects everyone.

2.2.2 Effects of Ecological degradation

Zambia has a large Catholic population in the urban with a vibrant network of pastoral initiatives and programmes such as Caritas Zambia, Small Christian Communities and lay associations like Legion of Mary, Women's League, St Anna and St Joachim besides lay Franciscans. These Church groupings have not shown concrete initiatives and programmes in ecology in both the

rural and urban areas. Roemer (1982) observes that environmental problems in urban areas produce a wide range of social, economic and health effects. For instance, Pollution affects the health of the inhabitants and impacts on the economy's underperformance due to employees' ill health. Mt Makulu Research station in Lusaka province, Zambia, relocated to Golden Valley in Chisamba because cement powder, silica, and unburnt lime from Chilanga cement factory polluted soils, and vegetation around its vicinity (Environmental Council of Zambia, 2000).

The Environmental Council of Zambia (*ibid*) notes that workers at Chilanga Cement factory are known to suffer from skin, eye and nose ailments. Besides, cement reduces the body immunity system, mortality from respiratory illness like tuberculosis became usual at Mt Makulu. This prompted expatriate staff to leave. Unless, ecological management is well co-ordinated it remains a menace to development. President Rupiah Banda notes that the environment is central to sustainable development (Sunday Post, 19th September 2010).

Ecological management is the basis of sound development owing to the fact that Natural Resources provide its sustenance (Environmental Council of Zambia, 2000). The nation has just learnt that Zambia's environmental legal and regulatory framework needs improvement (Sunday Post, 19th September 2010)

Undoubtedly, Ecological degradation emerges from governmental and industrial irresponsibility, besides public and individual disrespect for ecology. (Klein, 1989, Timberlake, 1994). It is largely a product of what Pope John Paul II (1990) terms progressive and indiscriminate application of advances in science and technology.

2.2.3 Causes of Ecological degradation

The Catholic Catechism teaches that sustainability and harmony in ecology results from a diversity of beings and from the relationships which exist among them (<http://conservation.catholic.org/catechism>). Each creature possesses its own unique goodness and manifests God's infinite wisdom and goodness. Moreover, the display of numerous diversities and variations of creatures shows that no creature is self-sufficient. These diversities and variations in the ecosystem require responsible co-existence. The Catholic Church teaches that the vocation of man and woman is to care for ecology as stewards of God (*ibid*). It further explains that this sovereignty should not be an arbitrary and destructive domination (*ibid*).

Human beings, however, have selfishly plundered the natural resources of the earth, which is God's gift to all creation. Pope John Paul II (1989) observes that People consume the resources of the earth and their own life in an excessive and disordered way. In affirmation Mulongo et al (2010:547) analyses today's ecological scenario as pathetic to the extent that humanity has reduced itself to the state of destitution. This is observable in the change of economic approaches; economic liberalisation, which have influenced people's lifestyles (*ibid*). Individuals, governments and the corporate world have prioritized wealth creation and profit generation with negligible regard for the ecology (*ibid*).

According to the Environmental Council of Zambia (2001) economic liberalisation in Zambia generated ecological and social impacts. Electricity tariffs have been increased with a view to doing away with public subsidies so as to meet operation and maintenance costs and to motivate private investment in the energy sector (*ibid*). High electricity tariffs, consequently, have encouraged the use of fuel wood for heating and cooking thereby supporting deforestation (*ibid*). Phiri (2010) indicates that statistics shows that about seventy per cent (70%) to eighty per cent

(80%) of the urban population in Zambia depends on fuel wood for cooking. The high demand for charcoal has created a lucrative charcoal business leading to massive deforestation (*ibid*). This is encouraged by the high levels of poverty and the underfunded forestry department which is unable to supervise the cutting downing of trees (Environment Council of Zambia, 2001). Cheyeka (2006) observes that the poor mainly depend on charcoal and wood for their fuel needs and income.

The interdependence between poverty and ecological degradation cannot be underestimated. According to the Environmental Council of Zambia (2001) and Cheyeka (2006) poverty is one of the greatest threats to ecology. The poor over depend on natural resources for their survival (Brown, 1989) at the time they are exploited by profit-making oriented socio-economic policies and activities. Karl Marx had argued that people as social beings should benefit from the gains of social collaboration (McBrien, 1994) Marx further argues that the prevalence of high poverty levels is due to capitalistic lifestyles (*ibid*). Boff (1999:235) adds that private ownership and unfairness in the sharing of natural resources lead to the deterioration of the quality of life in a capitalistic economy.

The emergence of the industrial society, however, should not be viewed entirely as a particular feature of capitalism characterised by greed and hubris, rather than a combination of genuine desire for improvement with malevolent practices (Royal, 1997). One notices that ecological degradation is a question of unjust socio-economic relationships between human beings and the rest of ecology. Wakarega (2009:134) explains that “justice is an active relational concept” which refers to equitable sharing of the available resources. From Cheyeka’s (2006) perspective, the poor have resorted to mining sand, quarry stones and digging out black soil to supply the rich who are building expensive housing units and laying out lawns. The poor do this to make ends

meet. He maintains that the mining of sand, black soil and rocks is a serious albeit ignored problem (*ibid*), as no one bothers about this ecological hazard. Cheyeka (*ibid*) observes that these mining activities make craters common in the shanties and suburbs of Lusaka, which threatens life as they are usually full of water thereby creating a suitable environment for mosquitoes to breed. Besides, some people have been reported to have drowned and died in water filled craters.

The poor not only suffer from the effects of environment degradation, they become potential contributors to environmental degradation (Brown, 1989). Conversely, Lesseps (2002) argues that the poor are not the main contributors to environmental degradation. It is the rich people and countries who contribute largely to environmental degradation through their excessive use of natural resources and their disposal of waste material in excess of the earth's ability to absorb them (*ibid*). In *Centesimus Annus*, Pope John II observes that the ecological question is accompanied and connected to the problem of consumerism, infringement of human rights and unequal access to the earth's resources.

Wakarega's (2009) notes that Human beings desire to Lord and own the earth. This mindset has led humanity to seek for joy in personal gratification than in integral sustainable development. Hence, the effects of ecological degradation are a response to human beings' abuse of ecology. Berry (1999) explains that the planet cannot support its human presence unless there is a reciprocal human support for the life systems of the planet. One can deduce that the effects of ecological degradation manifest peoples' relations with the rest of ecology. In his World Day of Peace, 1st January 2007, message, Pope Benedict XVI explained that

Alongside the ecology of nature, there exists what can be called a "human" ecology, which in turn demands a "social" ecology. All this means that

humanity, if it truly desires peace, must be increasingly conscious of the links between natural ecology, or respect for nature, and human ecology. Experience shows that disregard for the environment always harms human coexistence, and vice versa.

Today, humanity is held at ransom by effects of ecological degradation such as climate change. In his opening speech of the fifth session of the Tenth National Assembly, President Rupiah Banda notes that the floods and drought recently experienced in our country highlight the threat from climate change (*Sunday Post*, 19th September, 2010). The leadership of the Catholic Church has termed this phenomenon an ecological crisis (Pope John Paul II, 1990). To avert this crisis, Moltmann in Wakarega (2009:132) advocates for the need to change peoples' mindset towards ecology; human beings must strive to learn a new communicative and integrative thought, because to be alive means existing in relationships with other people and things, life is communication of communion. Moltmann's hypothesis supposes the relevance of faith or rather Christian approach to the ecological crisis.

2.3 The role of the Catholic Church in Ecology

Christianity has the ability to take up a central role in the formulation of worldviews that would orient humanity towards ecology (Dyer, 1975). As such the Catholic Church being the largest constituent of Christianity has the theological and moral responsibility towards the formulation of worldviews that would responsibly direct humanity towards ecology. Worldviews direct society in what and how it is to think about life and the world. Luzbetak (1987) defines worldview as a representation of the deepest questions one might ask about the world and life, and about the corresponding orientation which one should take toward them. Mbiti (1982) hypothesizes that a purely secular man is, for the genuine African, without full and authentic

personality, implying that an African is a religious person. As such religion provides a foundation on which ethics define an African's life. This would also apply to other human races.

Royal (1997) notes that most Americans form their moral judgments on religious grounds. Royal (*ibid*) explains that the late Carl Sagan, an atheist was influential in establishing a joint scientists/believers environmental network, because he accepted that religious passion was the only force likely to mobilize Americans for environmental work. Likewise, Edward .O.Wilson, an atheist, biologist and champion of biodiversity has argued in religious language that Biodiversity is the creation (*ibid*).

Still others may see the role of the Catholic Church in ecology as mere scepticism. This can be attributed to Aquiline's (2010) explanation that religion is an ambivalent reality containing within itself, the power to destroy or liberate. However, alleging that religion is ambivalent is not to underestimate its divine character and potential to transform relations (*ibid*). Aquiline (*ibid*) maintains that the ambivalence arises as the human perception which is imperfectly shaped by cultural dynamics encounters the sacred. Wijssen and Tanner (2000) show that Catholic pastoral workers in Sukumaland in Tanzania have increasingly left the spiritual out of their everyday affairs in response to the dictates of modernity. According to Wijssen and Tanner (*ibid*) the Sukuma have noticed a decline of the spiritual and the dominance of the pragmatic particularly in the lives of church executives.

Religion such as Christianity possesses a prophetic voice which defies oppressive structures. Aquiline (2010) shows that only religion proclaims mercifulness, repentance, forgiveness, love and compassion. For this reason believers and non believers turn to religion in search of effective models of social transformation (*ibid*)

One may doubt the ability of the Catholic Church to mitigate ecological degradation owing to Christian theology's emphasis on anthropocentric relations with God disregarding other facets of ecology (White, 1967, Wakarega, 2009, Cheyeka, 2006). Christianity is based on the care of humanity rather than of the ecology (Wijsen and Tanner 2000:79). The history of the Catholic Church, unveils a largely anthropocentric biased spirituality.

2.3.1 The influence of Anthropocentrism on the role of the Catholic Church in ecology

Plato's philosophical concept of Perfection as opposed to imperfection and the difference between matter and form, influenced Christian spirituality in the Early Church. Wakarega (2009) shows that on the basis of Plato's philosophy a dualistic approach of relating with ecology developed. Christians took salvation to be deliverance from the worldly matter and senses (*ibid*)

Aristotle, a disciple of Plato grounded his philosophy on observable rather than on transcendental phenomenon. He emphasised that matter and form cannot exist as separate elements. Plato and Aristotle's philosophies influenced early Christian theology as they attempted to explain the creator's relationship with the creatures (*ibid*).

According to Ken in Wakarega (2009) Irenaeus, a Catholic Philosopher in the Early Church explained that God's original intention in creating the world was to bring all things to fulfillment and consumption. Conversely, Origen another greater thinker of the Catholic Church emphasised that matter is created only for the purpose of educating humanity through trials and tribulations in order to return to a higher incorporeal spiritual destiny (*ibid*). As such, the early Church embraced the negative view of manipulating ecology for human survival. St Augustine of Hippo, maintained that "all creation was for God's glory and not for human benefit (Santmire, 1985).The Catechism of the Catholic Church (<http://conservation.catholic.org/catechism>) shows that St Augustine issued this challenge:

Question the beauty of the earth, question the beauty of the sea, question the beauty of the air distending and diffusing itself, question the beauty of the sky...question all these realities. All respond: “see, we are beautiful.”...who made them if not the Beautiful One who is not subject to change?

This excerpt evidently explains the fact that notable Catholic figures had realised the significance of ecology and revered it.

Wakagera (2009), moreover, notes that Thomas Aquinas placed emphasis on the presence of God in all creation. However, Thomas Aquinas presented an order of creation which positioned human beings on the summit of the creation hierarch. In this hierarch the natural world was subordinate to humanity.

The approach to raise humanity in the order of creation led Catholic Church spirituality to be anthropocentric. Ken in Wakarega (*ibid*:136) explains that “the hierarchical arranging of the lower and higher creatures, greater and lesser sharers of divine goodness, even the teaching that intellectual nature was superior to material nature and was considered to be essential for the fulfillment of the reason for existence.”

2.3.2 The Secularisation of ecology

In the thirteenth century, the Christian world witnessed social, economical and religious transformation. Individualism and the masterly exploitation of ecology appealed to the general populace (McBrien, 1994). Consequently, Catholic spirituality was expressed in terms of the human soul’s union with God through abandonment of and detachment from, all creatures and worldly realities (*ibid*).

St Francis of Assisi attempted to alter the world view of the order of creation by maintaining that the natural world was a manifestation of God's love and generosity (*ibid*). St Francis realised that every creation comes from the same source and this inspired him to call all created things no matter how insignificant his brothers and sisters (<http://www.franciscans.org./spirituality/html>).

Reformers of the 15th century, on the contrary, placed emphasis on the relationship between humanity and God, disregarding the rest of creation. According to Santmire (1985:133) the natural world was perceived to be a “mere thing, a world of objects, closed in upon itself, moved only by its own laws and not open to any other dimension or reality. It was a world which human beings must constantly transcend if they were to be rightly related to God.” This approach led to the secularisation of ecology, hence the chasm between religion and science which was more pronounced in the Catholic Church during the enlightenment era.

Religious scholars no longer focused on cosmic, earthly and cultural issues. They concentrated their efforts on humans' relations with God. Scientific understanding and technological capability scrutinised none of the religious issues but it took the centre stage (Cheyeka, 2006). According to McBrien (1994) the discoveries made by Copernicus and Galileo inaugurated the scientific revolution and later breakthroughs by Rene Descartes (1596-1650), Francis Bacon (1561-1626) and Isaac Newton (1642-1727) suggested an ultimate domination of the universe.

2.2.3 Reclaiming the ecology in Catholic spirituality.

In the middle of the twentieth century, however, spiritualities which were ecologically centred began to emerge in the Catholic Church. Teilhard de Chardin explained that the entire universe is a divine milieu (McBrien, 1994). In Teilhard de Chardin's perspective, the experience of God is not attained through purgation, contemplation and mystical union rather by turning towards the

things of the earth in love and reverence. McBrien (*ibid*) writes that Dom Hubert Von Zeller embraced and advocated for a sort of spirituality which sought for the truth in all things, while Thomas Merton emphasised the positivity of finding God in all things.

Conclusively, the history of the Church does not convincingly demonstrate to have had an elaborate ecological approach. This has attracted criticisms across the spectrum of society.

2.4 Lynn White's hypothesis

In 1967, Lynn White's article entitled, "The Historical Roots of our Ecological Crisis" was published in the magazine, *science*. White argued that in order to successfully address the emerging environmental crises, humans must examine and critique their attitudes towards nature. Ultimately, White's hypothesis concluded that people's attitudes towards nature are rooted in their religious beliefs. White explained that what people do about ecology depends on what they think about themselves in relation to things around them. He added that human ecology is deeply conditioned by beliefs about our nature and destiny.

In his analysis, White noted that human capacity to cause damage and destruction upon the environment grows out of western technological and scientific advances made since the medieval period. These advances have taken place in a social perspective informed by Judeo-Christian tradition. White asserts that Christianity is the most anthropocentric religion in the world. Christianity's emphasis on anthropocentrism gives humanity permission to exploit nature in a mood of indifference to the integrity of natural objects. White argued that Christian theology shows that nature exists to serve humanity

The effect of White's hypothesis serves as a condemnation of Christianity as the basis of our environmental problems and satirises the concept that Christianity is inadequately equipped to

mitigate the ecological crisis. Some critics on one hand, proposes that “it will be necessary to turn to Asian and traditional religion to develop the needed ecological ethics” (International Theological Commission, 2000-2002). On the other hand, White’s criticism implicitly shows that Christianity, particularly the Catholic Church, has for a long time underutilised its potential to curb ecological degradation and he was merely making an earnest call to rejuvenate the theological and ethical authority to address this concern. White appealed for a return to the simple nature ethics of St Francis of Assisi; a form of love and communion with nature (*ibid*).

2.4.1 Reactions to White’s (1967) thesis

Moore (1997:15) notes that White’s thesis provoked Christian ecologists who claimed that it was based on faulty exegesis of the Genesis text (Genesis 1:1-31). Human stewardship of creation is a central theme in the Genesis accounts of creation. At the end of Genesis 1, the writer concludes, “God saw everything that had been made and indeed it was very good” (Gen 1:31). This scripture also depicts a special relationship which God has with human beings through the *Imago Dei*; the theology that women and men are created in the image of God. The Catholic Church has taken a positive view of nature, and the special relationship that humanity has with God and the rest of creation.

The Catholic International Theological Commission (2000-2002) which Joseph Cardinal Ratzinger (Pope Benedict XVI) presided over, explains that the

The Christian theology of creation contributes directly to the resolution of the ecological crisis by affirming the fundamental truth that visible creation is itself a divine gift, the “original gift,” that establishes a “space” of communion. Indeed, we could say that Christian theology of ecology is an application of the theology

of creation. Noting that the term ecology combines the two Greek words *oikos* (house) and *logos* (word). Given that the inner life of the Blessed Trinity is one of communion, the divine act of creation is the gratuitous production of partners to share in this communion. For this reason, one can speak of the cosmos as a place of communion.

From the Catholic perspective, the ethical responsibility for the natural environment, our “housed existence,” is therefore based on a profound theological understanding of visible creation and humanity’s place within it (*ibid*). It can be deduced that critics like White (1967) emerged from a misunderstanding of the Christian theology. Christian theology does not encourage unrestrained development and possible depletion of the earth’s resources.

Furthermore, in re-aligning White’s hypothesis, Boff (1995), explains that the emphasis on dominion of human beings over the natural world which had infiltrated Christianity, was a product of the enlightenment philosophies advocated by Descartes (1596-1650). Descartes in his discourse on method shows that his theory of knowledge indicates that the vocation of human beings is realised in being ‘masters and proprietors of nature,’ While Bacon in praise of human knowledge resounded that, now we govern nature in opinions, but we are thrall to her in necessity; but we would be led by her invention, we should command her by action (Boff, 1995). According to Boff (*ibid*), Descartes and Bacon are the fathers of the modern dominative attitude over the earth, an attitude dearly appreciated in the capitalist society.

Burns (1992), Cheyeka (2006) and Namafe (2006) like Boff (1995) writes that enlightenment philosophers like Francis Bacon, Descartes, Isaac Newton and Immanuel Kant initiated the modernity scheme. They point out that the writings of these philosophers proposed a paradigm

shift in humanity's relationship with the natural world. According to Burns (1992) the Enlightenment Philosophers substituted the natural from the supernatural and science from theology. Burns (*ibid*) notes that human reason was deified and moral direction was sought by examining natural law rather than the teachings of the Church. Enlightenment thinkers invented modernity with a view to enhancing scientific and technological advancement besides establishing universal morality.

The significance attached to science in the enlightenment era positioned theology on the periphery to the point of rendering creation theology irrelevant (Cheyeka, 2006). Christianity faced the challenge of the scientific revolution. Scientific discourses raised important questions to which Christian theology failed to give comprehensive solutions.

Cheyeka (*ibid*) shows that enlightenment philosophers assumed that arts and sciences would encourage not only human's dominion over the natural forces but also the understanding of the world and of the self, moral advancement, justice and human happiness. This change showed negligible concern for ecology.

Science and technology, as a result became the indispensable *modus operandi* of modernity. The alienation of science from religion started with the trial and conviction of Galileo Galilei (1564-1642) (Burns, 1992). Those who condemned Galileo believed that if his will were allowed to prevail, the credibility of the church would be in disarray (*ibid*). The Catholic Church isolated herself from Galileo's scientific discourse.

The contemporary era has demonstrated that science and religion are complimentary in revaluing ecology. In Luzbetak (1987), Albert Einstein affirms that science without religion is lame; religion without science is blind. It is with this understanding that the *Gaudium et spes*, a Vatican

II Council document proclaims; prudent application of science has helped humanity to better the standard of life. Moreover, it is with a scientific and religious mindset that Pope John Paul II (1990) suggests:

We cannot interfere in one area of the Ecosystem without paying attention both to the consequences of such interference in other areas and to the well-being of future generations.

The International Catholic Theological Commission (2000-2002), furthermore, shows the relevance of science by outlining that stewardship of the ecology should be exercised by gaining scientific understanding of the universe.

2.5 Ecological Schools of thought

Critics attributing the degradation of ecology to Christianity have encouraged Christian scholars to formulate responses against this indictment. This reaction has three distinct schools of thought; the stewardship model, eco-feminism and creation spirituality. The stewardship model maintains that God did give humanity dominion over ecology on condition that it is exercised with prudence and care (Wakarega, 2009). While eco-feminism explains that dominion over women and ecology originates from the masculine, patriarchal institutions (Nalunnakkal, 1999). As for Creation Spirituality emphasis is placed on the call for a return to the nature mysticism of some medieval Christians like Francis of Assisi, (Boff, 1995), Julian of Norwich and Meister Eckhart (Berry, 1999). Of the three schools of thought the stewardship model is preferred by of the Catholic Church.

2.5.1 The Stewardship model

The Catholic Church has made attempts to devise ecological theology and ethics to ensure the efficacy of her stewardship role in the restoration of the ecology. Referring to this responsibility in the encyclical *Evangelium Vitae*, Pope John Paul II wrote:

As one called to till and look after the garden of the world, man/woman has a specific responsibility towards the environment in which he lives, towards the creation which God has put at the service of his personal dignity.

It is with ethical responsibility that the Catholic Church proclaims its role in ecology as that of a Steward (Pope John Paul II, 1990).

2.6 Catholic Social teachings on the stewardship of ecology

The Church's stewardship role is defined in the ethical foundations of the social teachings of the church. In the January 1990 message for the World Day of Peace, Pope John Paul II devoted the document on Green Catholicism in which, he insisted that the new ecological awareness, "rather than being downplayed, ought to be encouraged to develop into concrete programs and initiatives." He encouraged "carefully co-ordinated solutions based on a morally coherent world view," (McDonagh, 1990). The pope described the ecological crisis as a moral issue. It follows that in his Encyclical letter *Centesimus Annus*, Pope John Paul II indicated the ethical imperative of stewardship:

Not only has God given the earth to man/woman, who must use it with respect for the original good purpose for which it was given to him/her, but man/woman

is God's gift to man/woman. He/she must therefore respect the natural and moral structure with which he/she has been endowed.

In his first encyclical, *Redemptor Hominis* (The Redeemer of Humanity), the Pontiff writes, We seem to be increasingly aware of the fact that the exploitation of the earth, the planet on which we are living, demands rational and honest planning (No.15). Pope John Paul II acknowledged the threat of pollution to the natural environment. He proceeded to note that, it was the Creator's will that man/woman should communicate with nature as an intelligent and noble master and guardian, and not a needless exploiter and destroyer (*ibid*). As such man/woman's role in ecology demands that humanity should recognise that God is the creator and ruler of all creation and that human beings are creation's stewards.

In explaining man/woman's stewardship role in ecology, Pope John Paul II's (1990) corrects the ethics of dominion which perceives nature as created to meet human needs and recommends that human beings should be in solidarity with the natural world. The Pontiff (1989:41) notes the ills of the human attitude towards ecology as motivated by the desire to possess and consume resources of the earth in an excessive and disorganised way. Pope John Paul II (1990) stresses the point that the dominion of man/woman over the earth should be governed by ethics rather than science and technology. The Pontiff's theological clarification of the Genesis 1:28 marks the significance of Catholic Church's role in ecology.

In reinforcing the Catholic Church's ecological disposition, political philosopher Fortin (1997) qualifies White's argument as the Bible made me do it defence. He, additionally, maintains that the Bible never dispenses authority and responsibility from respecting the divine law and love for all creation. The Psalmist (Ps 32) declares, exercise stewardship and remain accountable to God.

Essentially, the destructive attitude human beings exhibit towards ecology requires a religious response and proposes the urgency for the change of behaviour and mindset. Basically among all creatures, human beings are morally responsible for their actions which should be directed towards the common good with others and the whole of ecology.

According to Pope John Paul II (1989:13) in stewardship, people must be informed by simplicity of life, self-disciplines and self-sacrifice. People need to be guided by something more than utilitarian calculations... Wakarega (2009) argues that human beings should exercise dominion over the natural world on the basis of their stewardship to domestic ecology to serve humanity without compromising the need of others and respect for creation. Barkey (2000) adds that humanity should foster intrinsic value of creation which manifest the glory and majesty we may contemplate in what God has made, and our surprising dignity as active stewards of the world.

Ultimately, the solution to ecological degradation evident in desertification, deforestation, and pollution can not be sourced from technological, scientific, political or economic fields solely. The degradation of ecology is basically theological and moral (Keenan, 2000). Science and technology are not ends in themselves; what is scientifically and technologically possible is not automatically ethical, the means does not justify the end.

In the Catholic International Theological Commission's (2000-2002) view, human beings should exercise stewardship by gaining scientific understanding of ecology, caring responsibly for the natural world and by guarding their biological integrity. The commission (*ibid*) explains that the moral legitimacy and efficacy of the means utilised by the steward gives the standard on which he/she will be judged. Science and technology must be put in the service of the divine design for the whole of creation and for all creatures (*ibid*).

The Bible gives a precise ethical direction which leads to a solution that respects the great good of life in the divine design (*ibid*). It is not possible to disregard religious ethics and theological considerations in ecology because of their intimate relationship to the people's worldview (Keenan, 2000). In dealing with ecology henceforth humanity should note that moral laws can not be violated with impunity in favour of scientific imperatives. Theology, on one hand, guides human beings to see the natural environment as a place of communion in which human beings, created in the image of God, must seek communion with one another and stewardship of creation. Theology, on the other hand, will not be able to provide humanity with a technical proposal for the resolution of ecological degradation (International Theological Commission, 2000-2002). Theology, however, provides the technocrats with ethical principles to ensure sustainability of ecology.

Bwalya's (2010) illustration of the ecological tension in Miombo Woodlands calls for a technical and ethical scheme to ensure its' resolution:

Trees are hosts to many forms of life species. We find on them bees, butterflies, and many other insects as well as other plants and birds and mammals. If trees are lost, other forms of life will die out. Let us look at 'Umutobo' (*Isobelina angolensis*); it is host to moths that lay eggs on the leaves from which caterpillars 'ifishimu/ifinkubala' hatch. So if 'Umutobo' dies out the moths will also be wiped out.

The loss of Miombo Woodlands in Zambia is largely a matter of misplaced ethics. It is driven by attitudes and attempts to maximise profits following the laws of demand and supply. In affirmation, Phiri (2010) indicates that the high demand for fuel wood has created a lucrative

charcoal business leading to massive deforestation. Deforestation leads to the extinction of some life species (Environmental Council of Zambia, 2001). The extinction of the 'ifishimu' moth would break the food chain and balance in the ecosystem. For most Zambians this moth is a cheap source of proteins.

Apparently, ecological degradation is multi-faceted it has social, economic, political and religious consequences. Well formulated ethics, therefore, can engage factors which govern human beings' relations in ecosystem into effective dialogue. In his World Day of Peace Message for 1990, Peace with God, Peace with All of Creation, Pope John Paul called humanity to focus on the very core of today's ecological degradation and deal with the moral predicament underlying the destruction of ecology. The ecological crisis manifest in the depletion of non renewable resources, pollution, increase in population, and the extinction of some life species, besides, the continuing depletion of the Ozone layer and greenhouse effect, (Pickering and Owen, 1995), are not initially ecological nor can they be dealt with technologically, politically, economically solely, they are theological and ethical (Keenan, 2000).

2.7 *Imago Dei*: Towards a new ecological and environmental ethics

The Catholic Church has in the phrase *Imago Dei* formulated a new ecological theology and environmental ethics that would guide, regulate and mitigate the spoils of scientific and technological advancement; these would include industrial pollution, resource depletion increased soil erosion and loss of farmland and the greenhouse effect and widespread destruction of species.

The climate of twentieth century western theology was not favorable to the theme of *Imago Dei* (McBrien, 1994). Secularization of theology rejected the notion of an objective reference in the

world locating man/woman with respect to God (International Theological Commission, 2000-2002). Consequently, secular and theological critics held the theology of the *imago Dei* responsible for encouraging ecological degradation (*ibid*).

According to the International theological commission of the Catholic Church (*ibid*) scripture, tradition and the *magisterium* explains the truth that human beings are created in the image of God (*imago Dei*) is at the heart of Christian revelation. The theology of the *imago Dei* affirms the human person's unique role in ecology. The principle theme within the theology of the *imago Dei* concerns participation in the life of divine communion (*ibid*). The ethical responsibility for ecology is guided by the theological understanding of the natural world and man/woman's role within it. God has commissioned man/woman as his steward in the way of the master of the Gospel parables (Luke 19:12). Created in the image of God (*imago Dei*), man/woman's sovereignty over ecology is only exercised in virtue of the privilege conferred upon him/her by God. The steward therefore must give an account of his/her stewardship and God will evaluate his/her actions.

2.7.1 *Imago Dei*: theological foundations of Catholic Social teachings

Ethics with regard to ecology in the social teaching of the church becomes what Keenan (*ibid*) calls a living out in human history, and in very concrete situations of sacred revelation. Hence, the Catholic Church considers sacred revelation to be bases of ethics. Pope John Paul II (1990) indicates that Biblical considerations help us to understand better the relationship between human activity and the whole of creation. In the same vein, the Vatican II Council declares that “the scripture enables us to recognize the inner nature, the value and the ordering of the whole creation to the praise of God” (Flannery, 1964).

2.7.1.1 Creation is fundamentally good

The Catholic Church, henceforth, affirms that All creation is fundamentally good (Gen 1, 4, 10, 12, 21, 25). Pope John Paul II (1990) explains the initial text of Genesis 1-3, as God's self-revelation to humanity. He emphasised the recurring refrain "and God saw it was good. After creating the heavens, the sea, the earth and all it contains, God created man and woman. At this moment the refrain changes (*ibid*): And God saw everything he had made and behold, it was very good (Gen 1:31). God's plan for creation is one of harmony and order (Gen 9:9-17, Hos 2:18). In this plan the human person is accorded privileged dignity.

2.7.1.2 The dignity and place of human beings in ecology

The *magisterium*, therefore, upholds that the human person enjoys an accomplished dignity within ecology. McBrien(1994) notes that intrinsic to this dignity is the privilege of exercising a wise and just stewardship over the rest of creation (Gen 1:26,28, Ps 8,6, Wis 9,2, Sir 17,2,5, Gen 2,15, Ps 104,14 Ps 115,16, Mt 25,14-30,Wis 9,14). The Catholic International Theological Commission (2000-2002) underlines the point that

...human beings occupy a unique place in the universe according to the divine plan: they enjoy the privilege of sharing in the divine governance of visible creation. This privilege is granted to them by the Creator who allows the creature made in His image to participate in his work, in His project of love and salvation, indeed in His own lordship over the universe....we speak of it here as a form of stewardship.

As stewards human beings act in place of the master (Mt 25:14ff) with the freedom they need to develop the gifts confided in them. The International Theological Commission (2000-2002) maintains that

Human stewardship of the created world is precisely a stewardship exercised by way of participation in the divine rule and is always subject to it. Human beings exercise this stewardship by gaining scientific understanding of the universe, by caring responsibly for the natural world...and by guiding their own biological integrity.

The steward is obliged to give an account of his stewardship, and the divine master will judge his actions because God has entrusted him / her with relevant skills and knowledge to execute his / her responsibility. It is a grave moral failure for human beings to act as rulers of visible creation who separate themselves from the higher, divine law (*ibid*)

2.7.1.3 Sin in ecology

The Catholic Church teaches that Sin brought division into the entire world, but not only within and between human persons (McBrien, 1994), The consequences of sin also affect the earth (Gen3,17, 4,11-12, Is 24,5-7, 9,2-7,9,9-17,Hos2,18). The Biblical foundations explain the relationship between human activity and the whole of creation (John Paul II, 1990). In this relationship, each time human beings disregard God's plan, God provokes a disorder which has inevitable consequences on the rest of creation. When human beings are not at peace with God, then the earth itself cannot be at peace (*ibid*). And so, the land will dry up and everything that lives on it will die. All the animals and birds, even the fish, will die (Hos 4:3).

2.7.1.4 Christ's Redemptive role in ecology

According to McBrien (1994) and Keenan (2000) Catholic traditions affirms that in a mysterious way, Christ's redemptive mission extends to all of creation (Rm 8:19-23, Rev21:1, 2 2Peter 3:13, Is 65; 17). In his World Peace Day message, 1990, Pope John Paul II emphasised:

Christians believe that the Death and Resurrection of Christ accomplished the work of reconciling humanity to the father, who “was pleased... through Christ to reconcile to himself all things, whether on earth or in heaven, making peace by the blood of his cross (Col. 1:19-20). Creation was thus made new (Rev. 21:5).

2.7.2 Ecological ethics of the theology of *Imago Dei*

The human person, among all the creatures on this earth, is ethically accountable for his or her actions which must be oriented towards the good: that of self, of others and of the earth and all that is in and on it, (Keenan, 2000). Keenan (*ibid*) purports that this assertion is the basis of sound ethics of the environment over and against one based on sentiment, on an indistinct nostalgia for a nonexistent “paradise lost” or on a pseudo-religious exaltation of nature. Keenan’s assertion moves one to gratitude and reverence for God’s creative love revealed in the vast universe. Under this gist, the Catholic Social teaching reminds us that human beings are called to act as stewards safeguarding the integrity of ecology (International Theological Commission, 2009)

2.7.2.1 Respect and Care for the ecology

Drawing its inspiration from the Scripture and the traditions of the Church, the ecological ethics of the Catholic Church, firstly, avows that there is an order in the universe which must be respected. In his address to 1970 Conference of the Food and Agriculture Organization, Pope Paul VI said that:

...everything is bound up together. You must be attentive to the great consequences which follow on every intervention of man/woman in the balance of nature, whose harmonious richness has been placed at his disposal in

accordance with the living design of the creator. ...the hour has now come for man/woman to dominate his/her domination of the earth....

Pope John Paul II (1990) further pointed out:

In our day, there is a growing awareness that world peace is threatened not only by the arms race, regional conflicts and continued injustices among peoples and nations, but also by a lack of due respect for nature, by the plundering of natural resources and by a progressive decline in the quality of life.

2.7.1.2 The unique role of humanity in ecology

The Catholic Church acknowledges the unique role of the human person in the ecology. Pope Benedict XVI (2007) suggested that Man/Woman is the only creature on earth that God willed for his own sake (*Gaudium et Spes* No.24). According to the Pope, the Catholic teaching affirms that, created in God's image, human beings take the place of responsible stewardship in the physical universe.

The Pontiff notes that man/woman should follow divine guidance and acknowledge the sacred character of ecology; by so doing the human race should see itself as a steward of God in the evolution of the universe (*ibid*). Besides exercising its stewardship of knowledge, the Church has the responsibility to locate modern scientific understandings within a Christian vision of the created universe (*ibid*).

2.7.1.3 The inalienable dignity of the human person

The Catholic Church, furthermore, affirms the inalienable dignity of the human person. In the Encyclical *Evangelium Vitae*, Pope John Paul II brings to light the worthiness of human dignity:

Man/woman is called to a fullness of life which far exceeds the dimensions of his earthly existence because it consists in sharing the very life of God. The loftiness of this supernatural vocation reveals the greatness and the inestimable value of human life even in its temporal phase.

Germain Grisez, a Catholic moral theologian, points out that humans are responsible for nature but not to it, as if it shared in the dignity and fundamental rights which they themselves enjoy as persons made in God's image, (<http://www-acton.org/ppolicy/comment/article-php?id=193>) . The International Theological Catholic Commission (2000-2002) of the Catholic Church, in addition, indicates that the Tradition and the *Magisterium* upholds the truth that Human beings are created in the image of God is at the heart of Christian revelation. The acknowledgment and respect of the human dignity is “the ultimate guiding norm for any sound economic, industrial or scientific development (John Paul II, 1990). Therefore, the excessive depletion of natural resources without the concern of others is contrary to Church's teaching.

2.7.1.4 The Common good

Moreover, the Catholic Church underscores the Universal destination of created goods (Keenan, 2000). It explains that the goods of the earth are ultimately destined for the benefit of all. According to Pope Paul VI (1967) all other rights whatsoever, including those of property and of free commerce, are subordinated to this principle. As such, human beings deserve access to natural, technological, intellectual and spiritual goods which support their integral development.

Keenan (2000) argues that development which is directed towards the common good of humanity particularly the poor will also care for ecology as destroying it would harm the human person and God's creation entrusted to human care. As such, the Church urges humanity to

oblige to commit itself to the good of all and of each individual being. In the encyclical *Sollicitudo Rei Socialis*, Pope John Paul II urges individual human beings to be committed to the common good, which is the good of all because we are all responsible.

2.8 Case study of the Catholic ecological position in the United States of America

The Catholic ethical and theological ecological principles illustrated in the theology of *Imago Dei* have so far been domesticated in some first world countries like the United States of America and brought down to the level of the Catholic populace. The catholic Bishops of the United State of America acknowledge the rich Catholic heritage of faith, tradition and social teaching as essential in the contemporary era (United State Conference of Catholic Bishops, 2001). The Bishops urge the faithful to embrace Pope John Paul II message, respect for life and for the dignity of the human person extends also to the rest of creation, which is called to join man/woman in praising God (*ibid*). Catholics in the United States of America are urged to responsibly “examine and act on the growing challenge of global climate change and its implications for God’s creation and for the poor and vulnerable (*ibid*)

The United States Conference for Bishops (*ibid*) elaborates that

At its core global climate change is not about economic theory or political platforms, nor about partisan advantage or interest group pressures. It is about the future of God’s creation and the one human family. It is about protecting both the human environment and the natural environment

Parishes, dioceses and other Catholic organizations are consequently encouraged to discuss climate change pursuing a civil and constructive approach that implores the virtue of prudence in

seeking solutions, and that is more responsive to the needs of the poor, both in the United States and abroad (*ibid*). The Bishops' conference appreciates and embraces the pontiff's counsel on the need for an ecumenical approach to addressing ecological degradation. Pope Benedict XVI insists in dialogue with Christians of various churches, we need to commit ourselves to caring for the created world, without squandering its resources and sharing them in a co-operative way (*ibid*)

Moreover, the Catholic Catechism in the United States accommodates ethical and theological imperatives of the theology of *imago Dei* as regards ecological degradation. Article no.334 of the United States Catholic Catechism, emphasizes solidarity among all creatures (<http://www.scborromeo.org/ccc.htm>). It underlines the need for solidarity as all creatures have the same creator and are all created to His glory. To indicate the imperativeness of this solidarity it revisits St Francis of Assisi's Canticle of the Creatures:

May you be praised, O Lord, in all your creatures, especially brother sun, by whom you give us light for the day; he is beautiful, radiating great splendor, and offering us a symbol of you, the Most High... May you be praised, my Lord, for sister water, who is very useful and humble, precious and chaste. May you be praised, my Lord, for sister earth, our mother, who bears and feeds us, and produces the variety of fruits and dappled flowers and grasses. Praise and bless my Lord, give thanks and serve him in all humility.

This portrays the Catholic Church's commitment to embrace a spirituality of integration driven by love and communion with the natural world. This spirituality should be respectfully upheld to

maintain the order and harmony of the natural world. It brings home the understanding that nothing exists that does not owe its existence to God the Creator (no.338)

Article 341, speaks of the beauty of the Universe; it affirms that the order and harmony of the natural world is as a result of the diversity of beings and from the relationships which exist among them. It further confirms that the beauty of creation reflects the infinite beauty of the creator and must inspire the respect and submission of man's intellect and will. The Catholic Church acknowledges that divine providence also works in the actions of other creatures (no.323). And that God has given human beings the ability to co-operate with His plans. It realizes that, as stewards of ecology, human beings should be awakened to the phenomenon of interdependence prevalent in the natural world.

Article 340, outlines the interdependence of creatures; it indicates that the sun and the moon, the cedar and the little flower, the eagle and the sparrow all display their diversities and inequalities and teach us that no creature is self-sufficient. Creatures can only exist in dependence on each other, to complete each other, in the service of each other.

How to adapt and implement the Catholic religious teaching in the task of revaluing ecology so as to prevent its destruction marks a significant phase in the mission of the Catholic Church particularly in Zambia. In fact, as the historian of religions, Berry (1988), has figured out, what is fundamental is a comprehensive re-evaluation of human-earth relations if the human race is to continue as a viable species on a progressively degraded planet. Additionally, major economic and political changes will be required to adopt worldviews that differ from those which have infiltrated the imagination of the contemporary industrialized societies that perceive the earth as a commodity to be exploited.

2.9 The bases for the adaptation of the theology of imago Dei in the Zambian context

The relevance of the Catholic Church's theology of *Imago Dei* in the Zambian ecological context is indispensable. Traditional African Religion provides the theology of *Imago Dei* with rich religious and cultural bases. The Traditional Zambian cultures, like most other African traditional cultures understand humanity in terms of interrelationship, hence the Bantu philosophy; I am because we are. The words we are, embraces the spiritual realm and the whole cosmos (Ilo, 2010)

Before 1890, the traditional African society was a religious communal entity which considered ecology sacred. Ilo (*ibid*: 432) explains that there was a spiritual ecology among traditional Africa which represented the triadic spirit of the ancestors, the living and the unborn; of the richness of the non-human world and their mutual interaction. The African's life was thus interspersed with religious experiences; every happening in the ecosystem was accorded a religious significance. (Snelson, 1974:2). Africans considered natural resources as the creator's provision. Mbiti (1969:48) notes that for Africans, the community realises itself in God and His providence in the universe.

Ecology, therefore, is an aspect of the perception of nature which formed the traditional African's worldview and philosophy as it existed in unity with the creator. Mbiti (1970) emphasises the fact that Africans perceive the reality of God in the natural world.

2.9.1 Ecology and traditional African life

Wijzen and Tanner (2000) illustrates that Anthropological literature shows that pre-industrial African societies had some specific reverence for nature and that their survival over the millennia was because of their religiously based restraints and considerations for their environments. As

such education of the young was largely conservative so as to preserve the significant departments of ecology like marshlands, water, forests and land. Snelson (1974:3) notes that young people were taught to make the best use of their physical environment and to be good providers.

2.9.2 The common good of humanity

Equitable distribution of resources of the physical environment among Africans had a decisive influence on them, as they treasured the common good bestowed in ecology. According to Ilo (2010) the continent is artistically depicted as Mama Africa to refer to the sacredness of the common good and the earth, totality and sanctity of life, besides the harmony between human beings and other beings. It further affirms Cheyeka's (2006) assumption that Africans are closely related to the natural world. This assumption is pragmatically grounded in African traditional society. Africans in the traditional society understood that forsaking ecology was tantamount to self destruction and breaking the relations with the creator. As such people were intimately acquainted with resources in the ecosystem and accepted with their symbiotic interaction with other beings (Colson, 2006).

2.9.3 African Cosmology

According to African cosmology, Tempels (1959) writes; all beings in the universe possess a vital force of their own: human, animal, vegetable or inanimate. Each being has been endowed by God with a certain force, capable of strengthening the vital energy of the strongest being of all creation: man. Tempels (*ibid*) demonstrates that for the African person there is an undisrupted communion with ecology in which the human beings and the natural world complement each other.

Tempels (*ibid*: 60) likens this complementarity to a spider's web of which one single thread cannot be caused to vibrate without shaking the whole web. As such, Bujo (1998) notes that the tension between life and death influences the whole of ecology. Human life diminishes if ecology is uncared for. According to Richards (1959) ethical imbalance in the Bemba traditional society was perceived to affect the entire natural world connected to human life.

For the Bemba traditionalist, therefore, immoral acts such as adultery not only affected the fecundity of the couple but it did affect the natural world to the extent of affecting agricultural production and climate. Bemba pre-marriage instructions included tutoring the bride and bridegroom to take care of the natural forests and rivers (*ibid*). As such the Bemba initiation Chisungu ceremony denotes the forest as a place of abundant life and fecundity.

In the Catholic theological perspective Bujo (1998:214) argues that a person whether in grace or in sin, cannot be neutral to nature. The fact that a person turns away from God impairs the whole of creation, causing it to sigh and groan. Bujo (*ibid*) further proposes that the human person has the responsibility of showing respect for creation and caring for it.

Lesseps (2002) explains that the rural poor in Zambia are conscious of the symbiotic relationship between human beings and the natural world. He notes that they live symbiotically with the rest of God's creatures on earth and are quite capable of using their own traditional knowledge and adopting new technologies that are environmentally friendly (*ibid*). According to Lesseps' (*ibid*) point of view the poor must be taken to be part of the solution to improving and regenerating the environment. The puzzle is how to incorporate the poor in ecological revaluation when in more ways than one they are the victims of the rich's greed.

In 1998, seventy-three percent (73%) of the Zambian population was considered poor out of which fifty-eight per cent were extremely poor and fifteen percent moderately poor (Environmental Council of Zambia, 2001). Apparently, the majority of Zambia's population depend entirely on the natural world for basic needs and services, which Lesseps(2002) itemizes as water, biomass for fuel, the land for crops and grazing animals, and forest products such as medicines and supplementary food like fruits, roots and mushroom.

In this study, the researcher proposes that the case of Zambia's ecological crisis should integrate the theology of *imago Dei* into the common Zambian social, economical, religious and political context. The theological and moral imperatives of the theology of *imago Dei* can be adapted to the Zambian context as the cultural and traditional values already appreciates some of the key concepts of *imago Dei*; respect for human dignity, sacredness of creation, communion with the natural world, and the common good.

The work of the Catholic Church and commitment of some Catholic religious leaders in Zambia shows that there can be a beneficial integration between faith and the public good. The researcher employed the case study of Kasisi Agricultural Training Centre, where Catholic inspired training of small scale farmers in sustainable and organic agriculture is taking place. This allowed for an in-depth study of the problem at hand and further built on the role of the Catholic Church in ecology.

CHAPTER THREE

3.0 METHODOLOGY.

3.1 Research Design

“A research design can be thought of as the structure of research” (Kombo and Tromp, 2006:70), which guides the researcher in data collection, analysis and interpretation (Bless and Higson-Smith, 2000:63-64). It attempts to obtain the best probable data as it defines the aims, objectives and purpose of study (Miles and Huberman 1994, Orodho, 2003, Kombo and Tromp, 2006). Additionally, a research design or strategy guides the researcher on the methodologies to be employed in the research. This research was qualitative and employed the case study design.

According to Bryman (2004), qualitative research seeks to understand the social world of people in a natural context. As a qualitative research strategy, a case study can be used to develop a comprehensive understanding of something by studying it in depth. Similarly, Kombo and Tromp (2006:72) add that case studies “seeks to describe a unit in detail, in context and holistically.” This creates favourable premises for deeper insight and understanding of the study. Cohen, Manion and Morrison (2003) further suggest that case studies show the cause and effect of a natural phenomenon. As such a case study focuses on relationships, interaction of events and other social processes in a natural setting following the rationale of qualitative research.

According to Cresswell (1998), the rationale underlying qualitative research is to stress the researcher’s role as an active learner capable of narrating a story from the participants’ perception.

In this respect, the case study approach enabled the researcher to interact, observe and investigate relationships and other social processes underlying the role of the Catholic Church in ecology as

exemplified by Kasisi Agricultural Training Centre. The case study approach was favourable for soliciting data about the role of the Catholic Church in ecology. Kombo and Tromp (2006:10) suggests that qualitative research encourages “flexibility of approach to allow for discovery of the unexpected and in depth investigation of particular topics.” A case study approach, therefore, allowed the researcher to use assorted sources of information, data and research methods. Bell (1995:63) indicates that methods are selected basing on their ability to provide the required data. Hence, the researcher engaged the use of questionnaires, focus group discussions, one to one interviews, document study and observation.

3.2 Study Site

The study was conducted at Kasisi Agricultural Training Centre and the Jesuit Centre for Theological Reflection. Kasisi Agricultural Training Centre is situated 30 Km north-east of the main Post Office in the centre of the city of Lusaka. Kasisi Agricultural Training Centre is a faith based non-profit making agricultural training centre owned by the Society of Jesus (Jesuits). It targets small scale farmers in the following agricultural areas:

- i) Chongwe: Buchetekelo, Kanakantapa, Chainda, Chinkuli, Sheleni
- ii) Nkomeshya: Lwimba, Lukoshi, Katoba
- iii) Bunda-Bunda: Chiyota, Nyangwenya, Namanongo, Ndubulula and Mpanshya in Rufunsa

3.3 Population

The population is the total demographic unit the researcher is interested in (Holborn et al, 2009:209). The research drew his sample study population from KATC, Chainda, Sheleni, Lwimba and Katoba agricultural areas and the Jesuit Centre for Theological Reflection.

3.3.1 Sample Study Population

A sample is a part of larger population, chosen as a cross section of the larger group (*ibid*). In addition, Kombo and Tromp (2006:84) define the sample study population as “a set of all the elements of interest in a study.” The researcher ensured that the selected respondents are active participants in the ecological agenda of KATC. Participants of the study were drawn from Kasisi Agricultural Training Centre and its peripheral; one (1) to five (5) Km from KATC, Chainda, Sheleni, Lwimba and Katoba agricultural areas and the Jesuit Centre for Theological Reflection. Participants included three (3) extension officers, one training officer, one research officer and seven (7) classified daily employees from KATC, ten (10) conventional farmers on the peripheral of KATC, three (3) organic farmers from Chainda, One organic lead farmer from Sheleni, one (1) organic lead farmer from Lwimba and five (5) organic farmers from Katoba and one priest from Jesuit Centre for Theological Reflection. The study included five students from the University of Zambia and the University of Namibia on attachment and research at KATC. The total sample population was 36.

3.4 Sampling Techniques

According to Kombo and Tromp (2006), Cohen, Manion and Marrison (2003), the choice of sampling techniques depends on the kind of research and the data required. The study employed the use of random and purposive sampling.

3.4.1 Purposive Sampling

This study is one of discovery rather than the testing of an hypothesis. Kombo and Tromp (2006:82) indicate that the rationale of purposive sampling is in the selection of informants and information for in-depth study of issues related to the core theme. The researcher sought for the technical advice and guidance of extension officers to select small scale farmers who are

practicing ecological friendly farming. Besides, he purposively selected extension officers as these are directly working with small scale farmers.

Similarly other KATC staff such as the research co-ordinator and training officer, including the classified daily employees was chosen because of their participation in the mission and ethos of KATC. By so doing it enabled the researcher to be focused on particular needs of the study.

Kombo and Tromp (*ibid*) show that purposive sampling helps the researcher to focus the research to specific needs of the study. All in all, the respondents were selected on accessibility basis besides they were informed about the topic under research.

3.4.2 Random Sampling

In this approach of sampling every unit has an equal opportunity of being selected (Holborn et al, 2009). As such farmers practicing conventional farming were randomly chosen because nearly all small scale farmers on the peripheral of Kasisi Agricultural Training Centre practice conventional farming thereby create a large sample to give a high chance of representativeness. The researcher indiscriminately selected ten (10) small scale farmers practicing conventional agriculture.

3.5. Research Instruments

Research instruments or tools are devices which a researcher employs in data collection and analysis. Ghosh (1992:213) explains that “the use of research instruments is dependant on the purpose and aims of the subject under study.” The researcher used assorted research instruments as to effectively realize the objectives of the study. White (2006) and Creswell (1994) assert that combining research instruments helps to over come deficiencies of some instruments. According to Kombo and Tromp (2006), research instruments include interview schedules, questionnaires,

observation, focus group discussions and document analysis. The researcher used interviews, questionnaires, observation, focus group discussions and document analysis to collect data.

3.5.1. Description of Instruments

3.5.1.1. Questionnaires

The use of questionnaires at the start of research can often be very useful because it helps one to collect a range of information which can be followed up as required (Koshy, 2008:87). Koshy (*Ibid*) explains that completed questionnaires provide baseline data of the research study and an analysis of questionnaires helps to form the type of questions to ask in personal interviews or observations one wishes to conduct. For these reason the researcher engaged the questionnaires at the initial stage of data collection.

Three kinds of questionnaires were utilized: Questionnaire A for ten small scale farmers practicing organic agriculture and Questionnaire B for KATC programme co-ordinators and extension officers and Questionnaire C for JCTR. The items were divided into four parts according to the objectives of the study besides the general information. Notably administering of questionnaires were reinforced with follow-up unstructured interviews to seek clarity.

3.5.1.2. Interview Guide

According to Koshy (*ibid*) the main purpose of conducting interviews is to collect responses which are richer and more informative than questionnaire data. In this respect, one to one unstructured interviews were conducted with KATC's research and training/extension co-ordinators, besides structured interviews were carried out for small scale farmers practicing conventional agriculture. All the interviews were tape-recorded.

3.5.1.2.1 Interview guide for Conventional Small Scale farmers

The Interview Guide for ten (10) conventional small scale farmers was standardized so as to increase the comparability of responses and reduce the interviewer effect and bias. This further facilitated the organization and analysis of data (Best and Kahn, 2009). The following questions were incorporated in the interview guide:

1. Why it is important to take care of the environment particularly land, water, forests, and air?
2. How is conventional farming the best kind of farming and why do you practice it?
3. What problems do you face in managing your farm?
4. How does KATC influence your agricultural practices?

3.5.1.2.2 Interview guide for the KATC Research, Extension/Training Co-ordinators, University Students on attachment and Research

Unstructured interviews were conducted with the KATC Co-ordinators of research, training and extension and the representative for the Jesuit Centre for Theological Reflection. Holborn (2009) explains that unstructured interviews do not have preset questions and take the form of a conversation.

3.5.1.3 Focus Group Discussion guide

Focus group discussion is a kind of group interview (*ibid*). According to Bryman (2004), focus group stresses on the common construction of meaning. Holborn et al (2009) adds that focus groups can encourage greater probing of why people do things and allow the researcher to

observe how people construct meaning in groups. The focus discussion guide was designed for seven (7) KATC classified daily employees under the following questions:

- i. How effective is KATC in conserving land, water, and tress?
- ii. What methods is KATC using to prevent environment degradation?
- iii. How are you involved in carrying out KATC's mission "to empower rural communities improve their livelihood through research, training and extension in organic agriculture and facilitating holistic rural development?"
- iv. Suggest ways of making KATC's work more effective

3.5.1.4 Document Analysis

Koshy (2008) explains that documentary evidence can often provide an essential background and context for the study and can also be illuminating, especially when you are comparing what is claimed and what has happened in practice. In this respect, some relevant documents were used for assessing the objectives of the study. Documents such as the current strategic plan, human resource policy, training manuals and annals were examined.

3.5.1.5 Observation Guide

The researcher became part of the social life of being studied as an overt participant observer. In Holborn's (2009) perspective, overt participant observers are open about doing research because it is unethical to mislead participants, it also allows the observer to ask questions and the observer can retain some detachment. Besides, researchers are less likely to impose their own concepts and preconceptions (*ibid*). Under this gist, the research formulated an observation guide

with some items based on the objectives of the study. The aim of the observation guide was to investigate the effectiveness of the role of KATC in ecology and to find out whether the present Catholic Church's ecological content and methods are adequately accessed and understood by the Small Scale Farmers.

The researcher investigated the following facilities and features:

- i. The KATC library
- ii. Maintenance of training facilities and other facilities in the centre
- iii. The behavior of KATC management, staff and small scale farmers with regard to time management and work relations
- iv. Demonstration plots
- v. manual work
- vi. Followed up and participated in the extension provision process

3.6. Validation of Instruments

According to Judd, Smith and Kidder in Alibeb (2002) validity is the degree to which the selected methods evaluate and describe the phenomena being studied. The questionnaires, interview guide and focus group discussion guide were tried on a small number of respondents at Kasisi Agriculture Training Centre so as to pilot test them. This enabled them to serve the intended purpose and it helped in making corrections and modifications where need arose (Bryman, 2004).

3.7. Administration of Research instruments

The researcher sought permission from KATC administration to lodge and engage into the study of the KATC's role in ecology. The questionnaires were distributed in person and with the help of the extension officers to the small scale farmers and to the sampled KATC members of staff. The questionnaire for JCTR was delivered in person to the representative of JCTR. To complete the questionnaires the respondents were asked to read the questions and tick appropriate responses from the options given for the closed questions and to supply information for open ended questions.

3.8 Data Collection

Data was collected largely through questionnaires, document analysis, focus group discussions, interviews and observation. The researcher got permission prior to the study at Kasisi Agricultural Training Centre, and the Jesuit Centre for Theological Reflection. The researcher explained to the respondents that the research was for academic purposes and assured them of confidentiality.

3.9 Data Analysis

Koshy (2008) recommends before embarking on data analysis it is important to revisit the aims, expectations of the study and the research questions. He explains that during data analysis one tries to identify themes and patterns in order to be able to present robust evidence for any claims he/she is making (*ibid*). Miles and Huberman (1994) in Koshy (2008) define qualitative data analysis as “consisting of three concurrent flows of activity: data reduction, data display and conclusion drawing verification.” Following the precepts of data reduction, the researcher got engaged in the practice of selecting, focusing, simplifying, abstracting and transforming the data

from field notes, questionnaires and tape recorder. The purpose of the data reduction was to make organized qualitative information. The analyzed data was non-numerical hence qualitative. The analysed data is presented in Chapter four.

CHAPTER FOUR.

4.0 Presentation and Discussion of the Findings

4.1 Introduction

Chapter four will consist of data analysis and presentation. Presentation of data will include the displaying of data gathered from KATC and farming areas under its influence particularly Lwimba, Katoba in Nkomeshya Farm Block and Chainda in Chongwe Farm Block beside the area one (1) to five (5) Km on the peripheral of KATC.

4.2 Ecology: The KATC Agenda

4.2 .1 The Vision of KATC

The vision of KATC is “to be a leading institution in sustainable and organic agriculture by facilitating holistic rural development” (Changula, 2008). The KATC staff value their institution as the leading faith based institution in the advocacy for sustainable and organic agriculture; “KATC is the only faith based institution in the province if not in Zambia championing the cause for sustainable and organic agriculture and we want to keep it so,” said one of the extension officers. These words exhibit a sense of collective purpose and a shared vision.

The co-ordinator of training and extension indicated that the vision is ecumenical in that it includes people of different faiths in its ecological scheme. He appreciates the communal and ecumenical aspect of the institution, “even if it is a catholic institution we who are non Catholic do not feel sidelined in any way.” KATC shows that ecological re-evaluation should be approached collectively. The institutions reaffirms Pope Benedict’s (2007) appeal to engage “in dialogue with Christians of various Churches...” so as to commit Christians in caring for the created world without squandering its resources and sharing them in a co-operative manner.

The researcher noted that stakeholders such as the JCTR and other non-governmental organizations like Misesan Cara of Ireland and the Scottish Catholic International Aid Fund (SCIAF) have had supported the KATC in monetary terms, technically and in solidarity. The interviewed extension officers mentioned that the co-operating partners share and advocate for KATC's aspirations, which focuses on values of social justice and peace, poverty eradication and ecological restoration through sustainable rural development.

The researcher observed that KATC's vision has enabled the institution, small scale farmers and the co-operating partners to establish collegial, working relations, in which training, research, extension, lobbying and advocacy structures are flexible task-oriented systems, composed of people with backgrounds in social and natural sciences, and traditional agricultural knowledge working together on defined projects. This allows the KATC to adopt a collaborative and participatory approach in addressing needs on the ground.

The vision focuses on holistic rural development which places the welfare of the human being particularly the small scale farmers at the centre. The researcher observed that KATC works to create an enabling environment for small scale farmers to achieve food and nutrition security besides increasing the farmers' financial returns without undermining environmental sustainability. The small scale farmers revealed that extension officers encourage them to use renewable resources such as soil, trees and water sustainably. Thiele (2002) purports that environmental sustainability dictates that the use of renewable resources such as top soil or clean fresh water should not exceed their rate of natural recovery. The researcher noted that KATC places the responsibility of ecological revaluation on humanity particularly the small scale farmers.

KATC works on the principle of inclusive of the most vulnerable segments of society and does not discriminate on the basis of religion, gender, nationality, ethnicity or disability. The institution respects the dignity and the inalienable role of humanity in the stewardship of the ecology. The theology of *imago Dei* asserts the human person's unique role in ecology. It maintains that ethical and technical responsibility for ecology should be informed by sound social and scientific sources (The International Theological Commission, 2009).

4.2.2 The Philosophy of KATC

The KATC Student attachment guidelines (2010:1) explain that

The philosophy of KATC is radically different from that of other institutions.

The staff and workers are at the service of the small scale farmers. Too often the reverse is seen and experienced in large institutions, where the poorer segments of society must work for the *apamwamba* (the rich)

The above means that the KATC ecological programme embraces and targets those with less power and influence, the most vulnerable, and the marginalized. The researcher observed that most of the small scale farmers served by KATC

- i. Are far away from the urban market,
- ii. Do not easily access Government subsidized synthetic fertilizers and other farm implements
- iii. Do not easily access good healthy and education facilities
- iv. Are exploited by scrupulous traders

v. Lack balanced diet

vi. Are not engaged in any economically viable venture other than agriculture

The researcher deduced that a phenomenon exists that the "poor" in our day includes rural communities; not because they are economically poor, even though this is correct, but because they are the least influential and their way of life is marginalized, ignored, or forgotten. The urgency of the principle of option for the poor is seen in the KATC's attitude towards work.

In his welcoming note the co-ordinator of Research underlined the importance of punctuality and respect for others work and time. He urged the researcher to adhere to the stipulated institution's extension programme unreservedly while seeking the guidance of the co-ordinator of extension programme and other members of staff. This indicated the commitment to realize a shared vision following stipulated values responsibly.

To ensure collective responsibility, the co-ordinator of research indicated the presence of clear-cut lines of responsibility, with each individual responsible to a supervisor. The researcher observed that responsibilities at KATC are divided among specialists in various departments. Each specialist has specific duties to perform. The staff consist of experts in agronomy, biology, animal science, agri-business, agricultural engineering, forestry, appropriate technology, administration, and accountancy.

The commitment to duty exhibited in being punctual and hardworking show that regardless of different work specialisation, employees of KATC aim at realizing the vision KATC "to be a leading training institute in organic agriculture by facilitating holistic rural development," under the mission statement "to empower rural communities to improve their livelihoods through

research, training, extension, co-operative development and market linkages (Kasisi Agricultural Training Centre, 2010).

The small scale farmers affirmed that “*KATC ilatubombela, tulalipala mukuipelesha mukusunga incende shesu, ukulima ifyakulya ifyalinga ulupwa lwesu ukwabula ukonaula umushili. Bali tuletela ubuya ntanshi ubo abafikansa fya chalo bakomaila po mubufwayo bwabo*” (KATC serves us, we pay back with commitment to taking care of the environment, producing enough food for our families without annihilating the soil. They have brought us genuine development which politicians have been preaching to us for their own sake).

The Philosophy of KATC shows that every person is exceptional and that she / he has a right to an environment in which she / he is able to live with dignity. KATC’s philosophy accommodates the gospel and mission of Jesus Christ to bring the good news pragmatically to the poor (Luke 4:18):

The Spirit of the Lord is upon me, because He has anointed me to bring the good news to the poor. He has sent me to proclaim release to the captives, and recovery of sight to the blind, to let the oppressed go free, to proclaim the year of the Lord’s favour.

As such under the guidance of the social teaching of the Catholic Church; “the joys and hopes and the sorrows and anxieties of people today, especially those who are poor and afflicted, are also the joys and hopes, sorrows and anxieties of the disciples of Christ and there is nothing truly human which does not also affect them” (Pope Paul VI, 1975). KATC attempts to serve all human beings regardless of sex, religion and ethnicity. “*KATC ina bwela kutitandidza pamene tinaganidza kuchoka kumunzi kuti tiyende ku Lusaka kuli ba chibululu, njala ina yofya*” (KATC

came to our aid when we thought of leaving the village to join relatives in Lusaka, hunger was threatening us). Essentially the small scale farmers' experience illustrates the recognition of the inalienable dignity of the human person regardless of status as profound in ecology. It was noted that upholding of the human dignity goes with the stewardship of ecology.

KATC Student attachment guidelines (*ibid*), assert that

Friendly use and sustenance of the earth's natural resources (environment) is one of KATC's key principles. This basic principle coupled with the ever increasing threats from the negative effects of climate change resulting from luxurious lifestyles which generate high carbon emissions, KATC employees are expected to adopt a life style (both at work and at home) which is simplistic, in harmony with nature and thus less destructive to the environment

According to the KATC staff, Kasisi Agricultural Training Centre is best described as a dynamic ecologically friendly community, implying theirs is not a static community. It is a community which is constantly in search of knowledge and skills as regards their areas of concern: sustainable agricultural development and ecology. Bolam et al (2005) has reviewed eight characteristics of effective dynamic communities; collective values and vision, collective responsibility, individual and shared professional learning, reflective professional enquiry, openness, networks and partners, inclusive membership and mutual trust, respect and support

KATC attempts to fulfill Bolam et al's community dynamics (*ibid*) by encouraging staff meetings in planning, implementation and evaluation of KATC's ecology agenda advocating for sustainable and organic agriculture. The institution also shares its successes and challenges with other concerned citizens. On the 22nd of December 2010, the institution hosted a delegation from

the House of Chiefs. The Chiefs were acquainted to successes and challenges of ecologically friendly agriculture.

This showed KATC's acknowledgement of the indispensable role of traditional leaders in the advocating and lobbying for the restoration of the ecology through sustainable and organic agriculture. The KATC endeavours "to inform, create awareness, persuade and influence the public with a view to facilitating the popularization and acceptance of organic agriculture as a viable alternative to conventional agriculture in the country," (KATC presentation, Agricultural and Commercial Show, 2010). The researcher observed that the institution freely attends to the farmers' concerns in its work schedule. Five farmers who came for consultation at the centre affirmed their satisfaction of the services rendered to them; "*Batu tambula kabotu, twa boolede ku buzya mbotunga twa langanya nyabo zya soya nokuba kuti imvwula icaampa ansi*". (We have been attended to nicely; we came to consult on how to tend the soya bean crop in the midst of heavy rainfall.)

The researcher observed that farmers easily access the KATC's staff because of the staff's simple life, salient of the Jesuit spirituality. He experienced that the staff accept and respect the farmers' status quo without suggesting their academic and technical advantage over them. This encourages mutual trust, respect and support.

Apparently, the philosophy of KATC illustrates that Human beings are supposed to exercise dominion over the natural world taking account of their stewardship to domestic ecology to serve humankind without compromising others' needs and respect for creation. From this perspective, Changula (2008) and Kasisi Agricultural Training Centre (2010) declare that the mission of

KATC is “to empower rural communities to improve their livelihoods through research, training, extension, co-operative development and market linkages.”

4.2.3 The mission of the KATC in ecology

Like the philosophy which guides it, the mission of KATC is fundamentally a Jesuit apostolate. As such it is driven by the Jesuit spirituality. McBrien (1994) defines spirituality as the way in which people live out their faith in God. Father Chiti of JCTR affirmed that following the example of St Ignatius¹, Jesuit life focuses on the imitation of Christ, centering on priority areas which represent the mind, heart, values and priorities of Jesus Christ. Jesuits are called to evangelise, to feed, to preach, to teach, to serve and to reconcile. They seek God in all things, especially in the poor, the marginalized and in creation.

Inspired by the Jesuit spirituality, the KATC calls on its staff to be morally upright (KATC Student Attachment Guidelines, 2010). This is an indication that the institution is conscious of the teachings of the Catholic Church on the effects of sin on ecology. The Church teaches that Sin is the source of division in ecology (McBrien, 1994). The effects of immorality affect the earth (Gen3,17, 4,11-12, Is 24,5-7, 9,2-7,9,9-17,Hos2,18).

The Classified Daily employees itemised the ‘don’ts’ of the institution as drunkardness, fornication, adultery, absenteeism, corruption, tribalism, stealing, reporting for work late, use of insults / abusive language, disobedience, misuse of land by applying chemicals, cutting down trees unnecessarily, and misusing water. ‘Dos’ include punctuality, accomplishing assigned

¹ St Ignatius (1491-1556) founded of the Society of Jesus in 1540. His spirituality was characterised by an awareness of being created and redeemed by God’s love, the understanding that Jesus initiates this redemption within the ordinariness of the world, demonstrating that the world is a good place to live and work, a desire to work as a companion of Jesus to continue this mission in the world, the practice of continual prayer and discernment to discover how God speaks to the soul and to seek in God in all things (www.nysj.org/s/316/index.aspx?sid=316&gid=1...887)

tasks well, respect for authority, humility to perform any task assigned and preparedness besides initiative, taking care of trees, land, animals and water.

The employees made the point that the values of KATC as regards work and life are not different from the cultural values of the local people, particularly its trainees. They mentioned respect for life, human responsibility over ecology, human dignity and the common good as some of cultural values appreciated by the people. The researcher observed that values and ethics pursued by the KATC help to keep the workers' focus on stewardship of the ecology as they individually and collectively learn to appreciate each other and the environment.

4.2.3.1 Moral imperatives in KATC's mission in ecology

Benge (1977) asserts that “hunger is not the tragedy of an empty stomach but it is the tragedy of a human mind not used.” Eric Ekholm of worldwatch Institute in Benge (*ibid*) is of the view that “even if we find ways to raise more food to feed the growing population, we won't have enough wood to cook it with.” Eric Ekholm's supposition implies that human beings tend to forget that the use of the earth's natural resources has a corresponding responsibility. Ken (1999:37) indicates that

The responsibility is to keep it (the ecology), produce from it and continue to care for it on behalf of God. The responsibility also comes with a reminder to share and distribute the blessings of the earth with all other living beings.

Ken's statement illustrates that ethical and theological imperatives should be at the core of ecological stewardship. As such KATC's ecological agenda upholds the dignity of humanity, social justice, community and family life, and the role of small scale farmers in ecology.

4.2.3.1.1. The alienable dignity of the small scale farmer

According to the JCTR (2008) many current approaches to rural people's concerns are narrow, short term, reactive and relief oriented. These approaches are piece-meal and designed to only address issues reactively; in the short term and only in the medium term e.g. fertilizer subsidies. The small scale farmers under the auspices of the KATC appreciate the institution's approach to their development. They revealed that KATC has restored their dignity by ensuring that they have access to a better livelihood; *“a KATC atibwezera ulemu wa umuntu wathu polimbitsa maziko a makalidwe athu.”*

Farmers attribute KATC's effectiveness in ecology to participatory approach to rural development. In pursuing the participatory approach, farmers are encouraged to own the process of development by being accountable and responsible custodians. The statement *“a KATC atibwezera ulemu wa umuntu wathu polimbitsa maziko a makalidwe athu,”* re-sounds KATC's respect and principle to uphold the dignity of the small scale farmers as human beings and major stakeholders by promoting a participatory approach to sustainable development. It reflects Paul IV's (1967) definition of development; the promotion of the good of people, every person and the whole person. The small scale farmers revealed that KATC participatory approach respects them because it is founded on discipline and good morals.

The small scale farmers see discipline and good morals as the basis of the KATC staff and workers' co-operation and dedication to duty. The workers indicated that the morality of the staff and workers is influenced by the Catholic character of the institution; *“Akatolika alibwino, sazikhuzza, amalandila munthu aliyonse popanda sankho la cipembedzo, ndiponso iwo afuna kuti anchito akale angwiro, ndiozipereka kwatunthu pa nichto zawo”* (the Catholics are simple and

welcoming, they do not discriminate against other churches). They emphasize moral uprightness of the employees). In affirmation, Pope Paul (*ibid*) explained that development work should be interested in the advancement of every person regardless of religious affiliation. They added that, “*Mweendelezi wa milimo, mukwesu Paulu muntu wa Leza alimwi uliluleme awalo uumuchilila muntu uululelme mbubonya buyo*” (the executive director Brother Paul is a religious and morally upright man so is his deputy director).

Apparently, in ecological stewardship, individuals must be informed by simplicity of life, self discipline and self sacrifice. People need to be guided by something more than utilitarian calculations. Human want, self-interest and ego-centrism distort the intrinsic value of ecology (John Paul II, 1989).

One notices that the moral life which permeates the KATC’s work culture shapes the institution’s conception of stewardship which is passed on to the small scale farmers through scientific research, training, extension services and production besides lobbying and advocacy.

The KATC as a steward of God in the ecology demonstrates stewardship of knowledge, bearing in mind that the Catholic Church has the responsibility to locate modern scientific understandings within a Christian vision of the ecology (*Gaudium et Spes* No.24).

4.2.3.1.2. Social justice

The researcher observed that the KATC’s employees’ simplicity in their approach to life is exhibited in their active presence in areas of need. The small farmers confirmed the employees’ attentiveness to their pace of adopting new trends of agriculture by admitting that it was not easy to change the set of convictions which guided the purposes, choices and strategies employed in

conventional agriculture. On one hand, farmers mentioned that government agricultural policies enticed them to maintain conventional agricultural practices more especially policies that favour certain crops over the other crops. They, on the other hand, applauded the efforts of KATC's in extension, research, and training services.

The small scale farmers revealed that unlike the government, KATC encourages them to take care of natural resources. The farmers mentioned that development which is based on exploitation of natural resources violates human rights and neglects the poor and future generations. More often than not, development which exploits natural resources does not consider issues of justice and in the process poverty is generated; the case of Neganega area, Mazabuka District, The Post, March 28, 2007, reported a land dispute between Albidon Mine and local community over the company's acquisition of extra hectares of land.

Ong'ong'a (1999:52) argues that

Africans when rendered incapable of producing sufficient food for themselves either turn against each other, or ...search the environment to see what it can offer to their needs

The above statement indicates that when exploited, the poor tend to barely survive by exploiting the environment to uplift their standard of life. The small scale farmers reported that KATC challenges them and the general public to appreciate their environment.

The researcher was informed that through lobbying and advocacy KATC informs, sensitises and influences the public to accept organic and sustainable agriculture as a practical alternative to conventional agriculture. This is done by presenting adequate scientific evidence to prove that

organic agriculture works. The scientific evidence is then disseminated through workshops and seminars.

The KATC's sustainable and organic agriculture project is appreciated because it is driven by moral and ethical values which do not alienate the beneficiaries from sharing the common good bestowed in natural resources.

4.2.3.1 3 The Common good

The KATC's approach to rural development demonstrates that goods of the earth are ultimately for the benefit humanity. Human beings deserve access to natural, technological, intellectual and spiritual goods which support their integral development not only those exclusive resources to harness natural resources. The small scale farmers are provided with the up to date sustainable and organic agriculture knowledge and skills such as agro-forestry, crop rotation and multi-cropping. Evidently, the small scale farmers' soil and crop management skills are yielding positive results.

Small Scale farmers value agro-forestry as a new and valuable element in agriculture. They illustrate their approval by revealing that the planting of trees like the *musangu* not only improves soil fertility, it enables the land to have a natural windbreak, beside affording them with a source of firewood and fodder for animal feed. According to the small scale farmers, trees in their fields prevent soil erosion and provide them with fresh air.

Commenting on the other importance of trees in the ecosystem, farmers reported that trees influence the rain patterns and that land without trees is prone to have less rainfall. In addition, farmers highlighted the medicinal value of trees. They mentioned that they had taken up the

initiative of encouraging fellow villagers to detest from activities like charcoal burning which encouraged deforestation. This is done through village meetings, church meetings, co-operative meetings and other social gatherings. To prove their sense of responsibility, the small scale farmers are ensuring that they plant and care for the trees provided by KATC. In the light of the theology of *Imago Dei*, the farmers do realize the relevance of divine communion with the rest of the ecology.

Sustainable and organic agriculture is being based on indigenous knowledge and systems that have been used for many years, although they are constantly being updated. Kelly (2010:70) purports that

Rural populations are aware of the need to maintain a balanced relationship with the environment that sustains them. Centuries of experience have resulted in patterns of cropping, animal husbandry, fishing and general environmental management that yield good returns without wreaking harm on the environment. The knowledge and skills for maintaining this balanced relationship are passed from generation to generation, not in a formal way, but through the informal learning of children from their parents and elders.

In affirmation, Small scale farmers reported that crop rotation and multi-cropping are not new concepts. They explained that these have been common practices in traditional agriculture. Crop rotation and multi-cropping, however, appear to be arguably, new concepts because they have been done away with by subsidized agriculture which encourages family and earth damaging practices at the expense of sustainable means. The farmers asserted that subsidized mono- crop

farming such as the one sponsored by the government is detrimental to their well being in that the benefits are short lived.

A study which was carried out by the Soils and Crops Research Branch of the Ministry of Agriculture and Co-operatives indicate that the institutionalized support given to the production of hybrid Maize (Mono-cropping) led to the decline in the yield of traditional staple foods such as sorghum and cassava and relish foods like pumpkin leaves, beans and groundnuts (Adaptive Research and Planning Teams Annual Reports of 1986, 1987 and 1988)

The small scale farmers bemoaned the government's lack of concern for soil fertility, trees and other life forms which support agriculture as exemplified in organic farming. The farmers indicated that considering the length of time government has helped them to depreciate the land, it has not come to their aid to revitalize the land by providing extension services and inputs such as lime to mitigate soil acidity. Some of them expressed surprise that the value, if any, of the small scale farmers. Consequently, the smaller scale farmer has the right to a just reward from his/her labour. In the long run the small scale farmers are learning to preserve the ecology on which they solely depend. In affirmation, Keenan (2000) explains that development which focuses on the common good of humanity particularly the poor will as well take care of ecology.

4.2.3.1 .4. Community and family life

Africans are said to have a well-developed sense of community (Shorter, 1973:196). Pope Paul VI (1967) acknowledges the relevance of community life and asserts the role of the Church:

As regards community life... we note that participation in the life of the community...is considered a precious duty and right of all.

Nyerere (1968: 6-7) re-affirms the traditional African ideal of community;

Our first step, therefore, must be to re-educate ourselves; to regain our former attitude of mind. In our traditional African society we were individuals within a community. We took care of the community and the community took care of us. We neither needed nor wished to exploit our fellow men.

Apparently, caring for each other and being good stewards of ecology are important in determining the quality of life. Sustainable and organic agriculture is about improving the quality of life of the people. Under this gist, KATC focuses on capacity building of local communities through training, extension services, and uses local evidence to lobby for sustainable and organic agriculture. Small scale farmers reported they have adopted sustainable agricultural technologies such as using cover crops, intercropping, agro-forestry, compost and animal manure to improve soil fertility and reduce soil erosion. The farmers mentioned that these techniques have helped to reduce deforestation. Farmers are now able to farm the same piece of land permanently.

The farmers mentioned that their farmlands are appreciating in value in that the soils are naturally fertilized. Richard (1994) asserts that the earth is very basic for the survival of the rural communities particularly the poor. Its destruction means destroying the rural communities' living space, culture and identity. The researcher noted that KATC re-echoes what Wakarega (2009) calls the 'African wisdom' which understood nature as a gift and God's manifestation to his people. The small scale farmers revealed that their attitude towards ecology informed by KATC and African traditional wisdom has benefited them positively.

The small scale farmers said that sustainable low-input drought-resistant farming techniques help their families to increase yields and nutrition levels. By so doing food insecurity is mitigated. According to the

farmers, food security has helped to reduce poverty in their families. The farmers mentioned that they able to buy essential commodities and pay for their children's school requirements by selling surplus production. They told the researcher that availability of adequate food in their homes has helped to reduce rural-urban drift in their area.

The small scale farmers reported that agriculture is not simply a matter of commerce and profit making; it is about protecting community, family and individual's lives. They mentioned that both KATC and African traditional wisdom upholds the value of life and co-operation in the family and community. One notes that KATC's approach to ecology reflects the need for sound human ecology. As such the KATC ecological agenda includes crossing cutting issues like Human Immunodeficiency Virus (HIV) / Acquired Immune Deficiency Syndrome, which endangers human life in families and communities. Small scale farmers reported that KATC staff particularly those in training and extension departments encourage them to abstain and remain faithful to their spouses. Apparently, HIV/AIDS contributes to ecological degradation. Kelly (2010:70) indicates that

The immediacy with which households suffer the labour and financial consequences of AIDS impairs their ability to make sustainable use of natural resources. When time, energy and money must be spent to relieve the impact of AIDS sickness and when there are fewer healthy individuals in a household who can put in a full day's work, concern for long-term ecological integrity is not a high priority.

Small scale farmers reaffirmed the above statement and added that food insecurity, which could be a result of unsustainable use of natural resources, leads to situations that enhance the increase

of HIV/AIDS and impairs initiatives to mitigate the spread of the epidemic. Kelly (*ibid*) purports that food insecurity may lead to situations and behaviours that heighten the risk of infection. The KATC, as a result, advocates for low-input farming techniques to improve food security and access to good nutrition. Access to food security and good nutrition is basic to any medical prescription.

4.2.3.1. 5. The unique role of the small scale farmer

In his 2008 Peace Day Message, Pope Benedict said:

The family needs a home, a fit environment in which to develop its proper relationships. For the human family, this home is the earth, the environment that God the creator has given us to inhabit with creativity and responsibility. We need to care for the environment: it has been entrusted to men and women to be protected and cultivated with responsible freedom, with the good of all as a constant guiding criterion.

Small scale farmers have embraced sustainable and organic farming as a criterion of caring for the environment. The farmers overwhelmingly appreciated KATC's training, extension and research services provided to sustain organic and sustainable agriculture practices they have embraced. The small scale farmers confirmed that KATC offers a variety of 3-5 day and 2 week courses in organic and sustainable agriculture. They also informed the researcher that their residential and on-farm training is supplemented by Yatsani radio's broadcasts on sustainable and organic agriculture. The farmers mentioned that the training is relevant to their situation in that it has enabled them to improve their food security. They identified the management and

application of organic fertilizers, crop rotation and diversity, soil improvement and management, and biological pest control as some of the prominent topics of ecological significance.

The small scale farmers indicated that extension services are carried out on a weekly basis. The farmers explained that extension services afford them the on the spot technical advice. This makes the practice and involvement in organic and sustainable agriculture feasible. Small scale farmers revealed that extension services make them feel part and parcel of the KATC. The researcher observed that the extension officers did not regard the small scale farmers as *tabularasa* or empty vessels to be filled in with what they as technocrats deem essential. Farmers were engaged in problem identification and solving through farmer study groups.

The researcher discovered that KATC encouraged the formation of study circle groups in the villages. Study circles adopt an adult participatory education approach. These study groups comprise seven (7) to twelve (12) farmers. The group selects the topic of study. The group leader or lead farmer, who is not an expert in the field, is trained by KATC in study-circle leadership skills. His / her role is to animate the study group through the sessions. Participants contribute to the learning process by sharing and working on practical exercises collectively. Documentary evidence shows that KATC has written seven study-circle manuals on; 'Small Earth Dam Construction,' 'Sustainable Agriculture,' 'Agro-forestry,' 'Organic Vegetable Production,' 'Manure Handling and Storage,' 'Food Legume Crops' and 'Organic Cotton Production.'

Farmers' study groups enable the farmers to participate in the research and extension services of KATC ensuring that the learning process is not constrained. Social networks and shared responsibilities are released in the study group meetings. According to the farmers, these meetings help them to awaken the common cause to care for the environment through their daily

occupational activities. They informed the researcher that group meetings help them to consolidate their understanding of their role in preserving and management of the natural resources.

The researcher noticed that the group meetings encouraged the small scale farmer to protect common natural resources by taking up the role of stewards of the ecology. He further noted that this approach to ecological education / campaign is a shift from a predominant world-view of technocrats in science and technology to an appreciation and application of multiple world-views of established through close collaboration of people with diverse ways of thinking and culture.

The researcher observed that the lead farmer manages a demonstration plot on his / her farm which turns out to be a referral project for the other farmers. The lead-farmer collaborates with extension officers in the management of the demonstration plot.

At Lwimba, the lead-farmer defined the demonstration plot as research work which involves the farmer from point A to Z. she added that such initiatives create an enabling environment for individual farmers to participate in self development on their own terms without being paid to do so. The researcher found out that no examinations or tests are given in this kind of training. Small scale farmers mentioned that demonstration lessons encourage them to explore alternatives thereby engaging psycho-social skills like decision making, creative and critical thinking besides survival skills such as management of an organic field.

The farmers explained that becoming an organic farmer is not a one-day affair; it requires constant assessment and thorough knowledge of organic farming for one to establish an informed decision. The interviewed farmers confirmed appreciation of the information and skills they

have acquired. The lead farmer at Katoba informed the researcher that organic farming is a sure way of caring for the environment because it makes the soil alive. He mentioned that while in conventional farming plants are fed with artificial fertilizers denying other organisms life, organic farming enriches the soil and sustains the lives of micro organisms and a diversity of flora and fauna.

Mwansa Mukuka a fourth-year University of Zambia (UNZA) soil science student on research at Kasisi Agriculture Training Centre agreed with the farmers informed argument that organic agriculture makes the soil vibrant with life in that biological micro organisms, the diversity of flora and fauna co-exist and offer assorted nutritional profile to the soil. The researcher observed that this agricultural trend has the capacity to revalue the ecology as it does not deplete natural resources and the ecosystem. Sampson (2010) asserts that natural resources and the ecosystem make the basis of agricultural production. He adds that long term sustainability of livelihoods particularly food supply is dependent upon a vibrant ecosystem.

The farmers expounded this trend of agriculture as enabling them to chart the way forward to sustainable food security and self-reliance as their land will remain useful as long as they lived. They attributed this phenomenon to what they termed as '*good*' agricultural practices such as agro-forestry, crop rotation and crop diversity enshrined in organic farming.

The KATC inculcates sustainable agricultural skills and knowledge in the small scale farmers because of the awareness and respect of the small scale farmers' unique role in ecology; that of a steward. The recognition and respect of the unique role of the small scale farmers enshrined in their human dignity is "the ultimate guiding norm for any sound economic, industrial or scientific development" (John Paul II, 1990).

It was noted that human beings in this case the small scale farmers are of supreme worth vis-à-vis the agro-ecological world as a whole. The researcher inferred that respecting the eco-system² does not imply considering the flora and fauna to be superior to human beings. Rather, it implies not to selfishly take ecology to be at the disposal of human interests. Future generations have the right to a secure ecology.

The researcher observed that all programmes offered by the KATC focus on identifying and appreciating human potential, natural resources and the environment as the foundation of economic and social development. The co-ordinator of research outlined that the strategic operational focus areas of KATC as research, training, extension, production unit and lobbying and advocacy.

4.2.4 Key Strategic Functional Areas

4.2.4.1 Training

The objective of KATC training programme is “to equip small scale farmers with knowledge and skills in organic agriculture and expose them to wide and appropriate technologies and ideas related to organic farming” (KATC presentation, Agricultural and Commercial Show, 2010). To realize this objective KATC ensures that it employs qualified personnel. The researcher discovered, KATC employs its staff basing on formal academic and professional qualifications. The co-ordinator of training and extension confirmed that specific qualifications are required for each job and individuals are employed on the basis of education, previous experience is an added advantage.

² I am not losing track of my adherence to ‘ecology.’ Eco-system sounds mechanistic (implying some parts are more important than the other). Here I use it to underscore the interrelatedness of nature in the *imago Dei* sense.

The researcher noted that the staff of KATC is appropriately qualified and experienced individuals with qualifications ranging from Diploma to Doctorate. It was further observed that KATC's support staff is not less than thirty on daily basis.

KATC, moreover, has necessary training and operational facilities. The researcher noticed the presence of administrative offices, a library, conference room, hostels, classrooms, a kitchen and dining room, demonstration plots, dairy and ranch cattle and donkeys, a dam, four-wheel Mitsubishi vans, heavy duty equipment like tractors, enough arable land and a workshop for appropriate technology.

The library is stocked with literature which covers themes such as sustainable agriculture, farm management, agro-forestry, agri-business, farmers' magazines, organic farming, study circle leadership, basic dairy and pasture, animal traction and management besides literature on Jesuit spirituality. In stock also are some course manuals on agro-forestry, entrepreneurship, manure handling and storage and sustainable agriculture, produced by KATC specialised staff. On one hand, documentary evidence of reflective professional enquiry is manifest in the choice of books members of staff borrow from the library as indicated in the log book. On the other hand, the library stocks negligible literature in vernacular. This implies that few small scale farmers have access to the library on a regular basis.

The extension officers interviewed regard continuing professional development as an essential tool for their field indicating that sustainability of ecology demands a constant revaluing of skills and knowledge perimeters. Reflective enquiry is perceptible in co-relation between the institution's research, training and extension services evidently in the published training manuals. The manuals encourage progressive learner centred approaches such as problem

solving, project, exploration and discovery methods. These approaches can be attributed to the institution's philosophy of work "to serve the small scale farmers... ." (KATC Student attachment Guidelines, 2010: 1). Small scale farmers are challenged to discover and explore alternatives.

The co-ordinator of training told me that the sustainable and organic agriculture course has enabled small scale farmers to be aware and to prevent ecological degradation in their area. He defined sustainable and organic agriculture as a way of practicing agriculture using the earth's resources moderately to provide what is sufficient for human needs and the needs of other creatures.

Going by this definition one realizes that KATC approaches the ecology with a sense of stewardship which respects the needs of the present without compromising the needs of the future while conserving the resources of the ecology. As such all the courses offered at KATC do not undermine the significance of the ecology. Courses include agro-forestry, biological pest control, permaculture design³, farm management, organic vegetable production and organic cotton production.

4.2.4.2 Extension

The objective of extension work is "to disseminate, monitor, facilitate and provide feedback on the implementation of the knowledge and skills acquired by the farmer through training and use of new organic farming technologies" (KATC presentation, Agricultural and Commercial Show,

³ An ecological design skill (which learns and mimics natural systems). It is a means of efficient energy utilization on farms, which ensures the production of wide variety of food stuff to ensure a balanced diet and enduring source of food to small scale farmers' households (KATC,2010)

2010:28). Extension officers meet every Saturday to evaluate the work done in the week and to plan for the next week.

The researcher noticed that these meetings encourage openness among staff as individual staff share their experiences of the work which are assessed and recommendations are sought out collectively. By so doing the extension staff operates as a single network of partners sharing the same vision and values. The extension officers interviewed mentioned that these meetings are necessary because they support vibrancy of the extension service besides, “we learn to appreciate and respect each others individual contribution collectively.” The researcher learnt that these meetings help to formulate interactive strategies which facilitate the active and interdependent involvement of trainee farmers in self development.

The co-ordinator of extension outlined the extension services as farmer follow up visits, demonstration plots, field days, on farm training and demonstration, farmer to farmer exchange visits and Radio Programmes. He said that the institution is serving total of one thousand two hundred (1200) farmers.

During the extension service trips the researcher noticed that the extension officers gave on the spot technical advice to the small scale farmers. This was necessary to ensure that the farmers were kept abreast with the demands of sustainable agriculture. While giving advice, the extension officers did not command or rather impose their skills and knowledge on the small scale farmers. Farmers were given room to assess their progress and propose solutions basing on their knowledge and skills.

Deductively, this approach invites the small scale farmers to be accountable and take up individual initiative and commitment to respond to present and future challenges while seeking technical advice. It also entrusts farmers with the ownership of the project. This entails that the KATC responds to the principles of the theology of *Imago Dei*. The dignity of the small scale farmers is respected because it has a unique role in ecology; the stewardship role, above all the farmers are created in God's image.

4.2.4.3 Research

The KATC research service's objective is outlined as "to identify, research and develop appropriate productivity enhancing technologies and to ensure that the implementation of these are monitored, reviewed and the information disseminated for further development as necessary" (KATC presentation, Agricultural and Commercial Show, 2010:30). The Co-ordinator of research disclosed that KATC collaborates with co-operating partners like the University of Zambia in the area of research. Apparently KATC has engaged into research to ensure it engages the right techniques in its quest for sustainable agriculture. The research co-ordinator indicated that verification trials are conducted for both indigenous and exotic technology guided by the research ethics not to endanger any life species. On campus is the permaculture project. The permaculture project presents the farmer with a near perfect ecological design skill which mimics the natural system.

In his explanation, the research co-ordinator revealed that the permaculture is meant to ensure the production of assorted crops to promote food security and nutrition in the small scale farmers' households. Undoubtedly, the KATC aspires to promote social justice in ensuring that

the poor small scale farmers have access to the common good exhibited in common natural resources.

The classified daily employees recommended the permaculture project for its ability to sustain soil fertility and biological pest control. They also indicated that this system of agriculture is not foreign to their land except it has been discarded in favour of the subsidized maize based agriculture. This project uplifts the spirits of the local classified daily employees noting that it is a cheap yet far reaching enterprise whose inputs can be sourced locally with none or little cash demand.

4.3 Accessibility and comprehension of Catholic Church's ecological approach and methods by Small scale farmers

The Catholic Church proclaims her role in ecology as that of a Steward (Pope John Paul II, 1990). The Church's stewardship role is explained in the ethical foundations of the social teachings of the church. In the January 1990 message for the World Day of Peace, Pope John Paul II, insisted that the new ecological awareness, "rather than being downplayed, ought to be encouraged to develop into concrete programs and initiatives." He encouraged "carefully coordinated solutions based on a morally coherent world view." The KATC is an example of a Catholic Church's concrete program which adheres to the theological and social teachings of the church.

As Catholic institution the KATC's ensures that its project in sustainable and organic agriculture is sustainable, promotes social justice and stewardship of the ecology. The themes of sustainability, social justice and stewardship permeate the training, extension and research

services offered by KATC. This affirmation can be inferred from the small scale farmers and the KATC staff's responses besides documentary evidence.

4.3.1 Small scale farmers responses

Small scale farmers pursuing the sustainable and organic agriculture project of the KATC indicated that they have a favourable access to information. The responses from the small scale farmers show that the KATC's approach to rural development awakens them to the need for sustainable development and stewardship in ecology. The small scale farmers indicated that KATC's approach embraces moral and ethical imperatives which enable an individual to have access to food, education, accommodation, clothing and communal inclusion as they are learning to be socially and economically viable.

They explained that multi-cropping, advocated by KATC's agricultural project is a risk mitigating mechanism which reduces reliance on dependence on a single crop and helps to manage the risk of unstable climatic conditions as crops respond differently. Hence, they asserted that their food security is not threatened. Therefore, KATC's stewardship role of ecology ensures increased family care and well-being, moreover, environmental costs are avoided.

The scale farmers also reported that retention of soil fertility does not alienate them from their land as they can use the piece of land for various agricultural activities over a long period without it depreciating in value. As such, this affords them the right to retain the benefit of a common good. Consequently, they assume the exercise of social responsibility in mitigating the degradation of the ecology. The farmers mentioned that apart from training them in sustainable and organic agriculture, KATC also trains them in agri-business management.

The researcher observed that KATC understands that access to capital, agri-business and collective bargaining capacity are critical to rural livelihoods. Hence its programme supports farmers in establishing markets for their produce locally and abroad. This fosters a sense of social inclusion and fulfillment in the farmers hence the affirmation that “*a KATC atibwezera ulemu wa umuntu wathu polimbitsa maziko a makalidwe athu.*” (KATC has enhanced our dignity). Ultimately, the consideration of an agricultural approach of rural development is its concern for human life and dignity. The Bishops in Minnesota (<http://www.dnu.org/>) in the final year before the new millennium mentioned that

The Church offers several principles to help us in this dialog and to guide policy decision-makers. We call on our tradition of respecting the life and dignity of the human person, promoting the common good, practicing stewardship of the land, and expressing a preferential option for the poor.

In addition to supporting improved production and business development, KATC works with CHOPPA to help increase marketability and market. KATC also works to link farmers to markets by participating in agricultural trade shows. This aspect of KATC enables the farmers to earn a living with dignity in ways that are capable of withstanding the challenges of ecological degradation and unfair agricultural commerce. In acknowledging this initiative Pope Pious XII (1967) mentioned that

Farming has essentially a family character and is, therefore, very important to the social and economic prosperity of the whole people. In consequence, the tiller of the soil has a special right to a proper reward from his labor

The accessibility and knowledge of the principles of the Catholic Church approach to ecology as exemplified in the KATC, is illustrated by the small scale farmers realization of the dignity of the human person, the inalienable role of humanity in ecological stewardship and the importance of sustainable development.

4.3.2 Conventional Small Scale Farmers' perception of KATC's role in ecology.

The small scale farmers on the peripheral of KATC have not convincingly embraced organic and sustainable agricultural practices. The interviewed farmers, however, acknowledged that KATC's programmes are favourable for their livelihood. They admitted to having witnessed success stories of the KATC's organic and sustainable agriculture initiative. The farmers mentioned that organic and sustainable agriculture encourage food security, soil fertility and does not annihilate the natural resources as observed at the organic fields and demonstration plots at KATC and at small scale farmers' organic fields in Chianda farming area. This section of farmers attribute KATC's success in ecology to its sound financial disposition and to the assistance received from co-operating partners, claiming that catholic institutions have a lot money to spend. Agriculture for these farmers is one of the economic activities which enhance their survival.

The researcher learnt that even in times of low yields farmers resort to selling their maize to any potential buyer. As such conventional small scale farmers on the peripheral of KATC have less regard for ecology. The conventional farming method has encouraged household poverty. Despite having sufficient rainfall, the farmers reported that their yields are decreasing each year. The farmers said their fields cannot do without the use synthetic fertilizer, which is usually supplied late. Additionally, the researcher noted that these farmers have no access to extension

services and the fertilizer support programme is not followed up by measures to mitigate soil acidity.

Three of the interviewed farmers have resorted to charcoal burning. Meanwhile, the farmers identified the effects of charcoal burning as loss of forest and soil fertility. They have however, embraced the practice as a necessary evil to respond to their essential needs such as food. The researcher observed that deforestation is a threat to food security and rural livelihoods and that poverty can force people to deplete natural resources.

The conventional small scale farmers do not solely rely on farming for their livelihood. The researcher discovered that the farmers under investigation have established a mechanism of spreading the risk of food insecurity in which they exchange their labour for resources such as food and money. They work for food as well as money, living one day at a time. Hence, their work culture lacks the value of sustainability. This can be attributed to over dependency on the KATC which gives them part-time work, conventional gardens whose produce is supplied to the Lusaka market, the local stream where they get fish for domestic consumption and for sale, and the government subsidized fertilizers.

Conventional small scale farmers, however, admitted that they have a duty to protect the natural environment from depletion. They argued that taking care of the natural environment is a Biblical imperative. The researcher noted that the notation of stewardship of ecology was not foreign to these farmers. The farmers indicated that they learnt of their responsibility for creation from the Bible and their churches. Five of the farmers are Catholic while one is New Apostolic and four are Pentecostals

4.3.3 Conventional small scale farmers' response to KATC's proposed role in ecology

The farmers explained that their resistance to change is driven by perceptible inappropriateness of organic agriculture to provide for their immediate needs. According to the farmers' responses organic farming is too slow to answer to the urgency of their demands for basic necessities. They explained that it takes time for one to realize a sustainable yield from organic farming. The researcher learnt that organic agriculture is labour intensive in the initial stage. The farmers mentioned that they have no time to devote to organic farming. They maintained that for the time being they are able to access artificial fertilizer from the government through the co-operatives at subsidized rates. According to the conventional small scale farmers, artificial fertilizers are cheaper and require less labour to apply.

The researcher noticed that small scale conventional farmers focus on the short term gains of conventional farming with negligible regard for its sustainability. These farmers do not accommodate the interests of future generations and the entire ecology. They are preoccupied with means of cushioning their poverty. They insistently claimed that organic farming is for those who already have enough food. The researcher observed that seven of the ten interviewed conventional farmers had run out of maize crop for their mealie meal by September.

The seven farmers reported that they normally can afford one meal in a day. "*Cacikulu ndithu, nichakuti cakudya tsopana ndilinaco,*" (My concern is that I have food here and now and the future will take care of itself) said Bana Mwamba. Her statement entails that as long as she has food for the day then all is well.

Bana Mwamba is a 56 year old widow whose late husband passed away in early December 2010. She informed the researcher that her late husband was well versed in organic and sustainable

agriculture having being trained at KATC five to six years ago. She claimed that their fields were productive and enabled them to have enough food supplies. Today, the once fertile and productive field is almost sandy because Bana Mwamba and the husband switched to conventional farming arguing that they needed time to rest and have some leisure time. Bana Mwamba and her late husband started brewing local beer for sale to offset the food deficit and indulged in excessive beer drinking.

Bana Mwamba informed the researcher that her husband died of liver failure. She said her late husband was over consuming beer. She told the researcher that for several times he was admitted to hospital, her husband was advised to stop beer drinking. According to Bana Mwamba, the husband died because of excessive beer drinking.

Searson and Chilufya (2008:61) purports that excessive consumption of alcohol is one of the major causes of poverty in Zambia. The spouses from five households informed the researcher that their husbands sold most of the maize for beer. The researcher observed that the said husbands were not engaged in any meaningful economic activity. He was told that in these households husbands spent most of their income on beer drinking at the expense of Children's school requirements, food and other essential commodities. The researcher was informed that these men spent most of their time at the local bar. As a result, the family fields were not well managed.

Small scale farmers practicing sustainable and organic farming maintained that this kind of agriculture requires dedication and commitment. On one hand, they said that sustainable and organic farming is labour intensive especially at the initial stage. On the other hand, the farmers

reported that sustainable and organic farming required less inputs as natural fertilizers were readily available.

For Bana Mwamba and the other conventional farmers organic, sustainable agriculture is labour intensive and the inputs are expensive. Like the other conventional farmers, Bana Mwamba maintains that natural fertilizers are expensive to afford as one requires huge quantities for a field were two 50kg bags of fertilizer would be used.

The researcher deduced that good morals are fundamental in ensuring the stewardship of ecology and that they are not compatible with poverty, not to mean that poor people are immoral. The culture of excessive beer drinking is detrimental to food security and the entire ecology. It was noticed that most of the conventional small scale farmers spend their earnings lavishly on beer with less regard for their daily nutrition requirements. Alongside beer drinking is prostitution. The researcher was informed that it is easier to afford a prostitute in this locality. He noted the level of ecological irresponsibility of the small scale conventional farmers corresponds to their moral conduct. Immorality negates values such as hard work, community and family life and perpetuates poverty which forces people to deplete the natural resources leading to degrading the eco-system on which they depend.

The farmers explained that they were unable to responsibly take care of the nature around them because of their preoccupation with tackling poverty. They are however, aware that deforestation which is widespread in the area has adverse effects on ecology. According to the farmers, deforestation can destabilize the rain patterns and encourage loss of soil fertility.

4.3.4 Classified Daily employees' responses on the effectiveness of KATC's role in ecology

The classified daily employees reported that KATC's organic and sustainable agriculture project is on the right course in that it responds to the needs of the farmers. They itemized the farmers' needs as food security and market for agriculture products, besides psycho-social needs listed as self-reliance and fulfillment. The researcher was told that the agricultural trends encouraged by KATC are able to afford one several food crops thereby improving the nutrition of a given household.

The workers maintained that the concept and practice of multi-cropping ensures that while some crops may not survive the change in climate, others would make it. Therefore, farmers are assured of having food even under climatic conditions like prolonged dry spells and above normal rainfall.

The classified daily employees reported that KATC finds market for farmers' products. This helps farmers to be self-reliant and they are able to realize some appreciable degree of fulfillment because of their accomplishment.

The classified daily employees attributed the effectiveness of KATC's role in ecology to the manner in which small scale farmers are enrolled at the centre. They noted that small scale farmers are not compelled to enroll at the centre, they voluntarily offer themselves to KATC's invitations. As such the farmers who are trained by KATC are self-motivated. Additionally, the classified daily employees disclosed that the methods of agriculture propagated by the KATC enable the farmer to use the same land effectively. They mentioned that the population of the area is increasing as such there is less fertile land. The classified daily employees reported that

the KATC sustainable and organic farming project shows cases environmentally friendly agricultural practices, which can enable farmers to use the land sustainably.

The classified daily employees claimed that their attentiveness to care for the environment is inspired by the engagement with KATC. They said that they are all affected by environmental degradation, beside indicating the sources of environmental degradation in their area to deforestation and bad agricultural practices.

4.3.5 KATC Staff's responses

The co-ordinator of researcher reported that research work should better the lives of people. The undercurrent of this statement is that research should come up with ways of improving the lives of the people. The researcher observed that research work at KATC is anchored in morality in that the sustainable and organic agriculture does not annihilate the natural habitat and human life. The case of permaculture experiments simply depict skills humanity should learn from the natural environment. This ecological agriculture design promotes the production of a variety of food crops thereby ensuring food security and nutrition.

Food security and nutrition are essential elements of social justice. Classified daily employees informed the researcher that the centre constructed a dam in 1996 in the vicinity to empower over 1000 small scale farmers in vegetable growing and fishing. The research noted that the dam serves the local community in irrigated production. The workers added that KATC ensures that her projects are sustainable and user friendly in that the philosophy of the centre is to serve the end user – the small scale farmer. As such the KATC ensures that the course content and training, research and extension approaches put the learner or trainee at the centre. Hence, the courses are life based; employing exploratory, project, problem solving, and group discussion

approaches of teaching and learning. These methods respect the dignity of the learner in that he/she is not treated as an empty vessel.

Responses from the KATC staff indicate that the institution respects the cultural and traditional background of their trainees. Extension officers indicated that the training and research, besides extension seek to integrate the values of their trainees' culture as regards human life and its relationship with the ecology. The co-ordinator of training / extension asserted that it is imperative that topics have to do with depletion of human life such as Human immune-deficiency Virus (HIV) /Acquired Immune Deficiency Syndrome (AIDS) are included in the course. The KATC programmes incorporate Human immune-deficiency Virus (HIV) / Acquired Immune Deficiency Syndrome (AIDS) education and advocacy in farmers training and work place strategic plan. The researcher deduced that sustainable development can only be realized through a holistic approach without undermining the effects of HIV/AIDS on KATC and the small scale farmers' Community.

4.3.6 Small scale farmers' involvement in the stewardship of ecology.

The researcher observed that the past trainees of KATC remain attached to the centre as long as they are pursuing the centre's stands for. This enables the farmers to access on going formation training. These farmers also take up the role of facilitating farmer to farmer training in the village. One can easily say that the centre has no past trainees as all belong to the KATC community.

The realization of the effects of ecological degradation has enabled farmers to take up a leading role in the stewardship of the ecology in their villages. The small scale farmers mentioned that they advocate tree planting to mitigate deforestation. This is done in the group study, co-

operative, village and church meetings. The farmers explained that deforestation affects the rain patterns and the fertility of the soil. They noted that activities like charcoal burning though economically rewarding are detrimental to their livelihood in that trees are not replaced.

The small scale farmers further indicated that the methods of agriculture propagated by KATC have enabled them to improve on soil management. The researcher noted that the farmers notation of soil management accommodated and cared for biodiversity. The methods do not affect life species in and on the soil as these were necessary to ensure that the soil was kept alive, hence fertile. This was noticeable in their use of compost manure and biological pest control where non natural substances were not utilized.

Farmers encourage other farmers in the vicinity to employ conservation techniques in the utilization of natural resources. They do not use fire to clear the bushes or get rid of the unwanted material in the fields. According to the farmers fire not only destroys the natural habitat it also affects the soil value over time. The researcher observed that KATC subscribes to the understanding that all human beings are co-responsible with God to protect the dignity of all creation and that the natural world has rights and needs to be respected and taken care of.

Notably the small scale farmers have learnt to be stewards of the ecology from the training, extension and research services they receive from KATC. The KATC has ensured that the development of small scale farmers continues in the farmers study group. This is an indication that farmers are encouraged to take collective stewardship of the ecology by sharing common values and vision; respect for flora and fauna, humanity and promoting sustainable development.

4.4 Challenges of KATC's role in ecology

4.4.1 Time

The small scale farmers indicated that the time allocated for extension service is not adequate. They informed the researcher that the time they spent with the extension officers needs to be adjusted. The researcher observed that extension services are often compromised by extension trips which are loaded with personnel's personal errands. Most probably the staff is not accorded enough time for shopping.

4.4.2 Farmers on the peripheral of the institution

The small scale conventional farmers on the peripheral of the institution who include some of the classified daily employees have not embraced sustainable and organic agriculture methods. They claim that they do not have enough time to devote to their fields. While others maintain that it is cheaper to use fertilizer sourced from government through co-operatives. The researcher learnt that the majority of these farmers depend on KATC. KATC offers them temporal jobs. Hence they claim that there is little time to dedicate to their fields. The centre needs to introduce a policy to curb the scourge of dependency on its resources which negates most classified daily employees from engaging into sustainable development.

The Catholic Church's commitment to ecology derives from its understanding that human beings particularly Christians have a responsibility to work for the well being of all humanity. The theology of *Imago Dei* asserts the goodness of creation and firmly resolves to defend the dignity of each human being especially the poor and vulnerable (The International Theological Commission, 2009). Environmental justice from a Catholic point of view articulates the church's conviction that the human dimension must be kept in focus.

4.4.3 Continuing Staff development.

While the institution has good facilities such as internet and the library, it is imperative that continuing staff development is encouraged. The researcher noted that the members of staff require a comprehensive staff development programme on ecological issues. This would enhance their skills and knowledge. Notably sustainable development require sustainable conceptual and skills training.

4.4.4 Accessibility to research work

The small scale farmers informed the researcher that they need to be availed with research findings performed on their property by non-KATC researchers. Otherwise they feel sidelined as they do not understand the implications of such research work. On the same note, the researcher noted that extension officers expressed the same sentiment. They do not access research work of which they help to facilitate, yet non-KATC researchers sign memorandums of understanding with KATC to avail their research work to the institution.

CHAPTER FIVE

Conclusion

The general conclusion of this study is that ecological degradation is not only an economic, political, or environmental problem; it is a moral and ethical issue. The common understanding that underpins the project of sustainable and organic agriculture advocated for by KATC is the moral responsibility to care for the present generation so as to protect ecology and the future generations, especially the poor people. The poor experience the most acute suffering from the effects of ecological degradation. Though essential, economical and scientific advancement have no ability to dictate the value of the lives of the present and future generations and the ecology.

The KATC project borders on change of the mindset as the profound disposition of responding to the consequences of ecological degradation. Change of the mindset is grounded in morality and ethics of solidarity. As such the farmers have learnt to work in study groups and to advocate for change collectively. The institution utilizes an innovative model of extension delivery which fosters communal and individual efforts to change the unecologically friendly agricultural practices. This model of extension delivery assumes that change is desirable when it is founded on co-operation. As such it respects the rights of individuals to retain dignity and self esteem through ownership of the development process in line with principles of the theology of *imago Dei*; the unique and divine role of humanity in ecology, the destiny of the common good, respect and care for ecology, the inalienable dignity of man/woman.

The standard theme within the theology of the *imago Dei* concerns participation in the life of divine communion (International Theological Commission, 2009). The ethical responsibility for ecology is guided by the theological understanding of the natural world and man/woman's role

within it. God has commissioned man/woman as his steward in the way of the master of the Gospel parables (Luke 19:12).

In this respect, extension agents combine efforts with farmer study groups; farmers meet within particular communities to share information on specific topics while the extension agent provides the technique advice on raised queries. The small scale farmers are responsible and accountable for the welfare of the ecology in their milieu.

This approach ensures that change is embedded in the fabric of the individual farmer and his /her network of relationship besides the whole village. In this process the inalienable dignity of the trainee small scale farmers is held with high esteem. The KATC, consequently, propagates an agricultural trend which supports the ecosystem without negating the cultural values of the trainee small scale farmers.

The centre appreciates and commends community life, family life, respect and care for the natural world and the fear of God. The institution also integrates the good traditional farming practices with scientific methods which do not deplete the ecology. Thus, KATC advocates that its employees as role models should adopt a life style which is simplistic, in harmony with nature and ecologically viable. Moreover as a Catholic institution, KATC demands that the employees' conduct and lifestyle exhibit moral and ethical standards which should not conflict with their faith dispositions and cultural context of their trainees.

The KATC has demonstrated that ecological training and research must be guided by principles which respect and cares for the ecology. Therefore, the centre fosters sustainability. Sustainability in the light of KATC's activities can be described as development which responds to the needs of people without compromising the ability of the ecology to support life besides the

needs of future generations. One realizes that sustainability is an element of social justice as it fosters accessibility of the common good in present and future generations, besides the complementarity between humans and the ecology.

The small scale farmers who have adopted sustainable and organic agriculture have understood and appreciated the fact that ecology is a live entity with which they should live in symbiosis. Consequently, the agricultural dexterity cannot be reduced to a foundation of economic gains. It is an art in which human beings appreciate their being stewards of the ecology.

While it is imperative to gain economically from natural resources, the KATC's concern is basically to mitigate human suffering and ecological depletion. Through the institution's initiative small scale farmers recognize that they have a duty to protect their common natural resource as stewards. The farmers' experience indicates that disregard of the ecology affects human co-existence with nature; *“alukalema likota bumanswe, pula aina kunela hande mi haluna kuba ni lichu”* (If we cut down the trees indiscriminately, the rain pattern will be affected and we won't grow food). Berry (1999) asserts that the planet cannot support its human presence unless there is a reciprocal human support for the life systems of the planet.

This study does not represent the general role of the Catholic Church in ecology in Zambia. It does, however, illustrate that KATC is an example of the domestication of the teaching of the church on ecology in a context where the ecology is negligibly addressed.

Recommendations

There are several aspects in the study which could be adopted by faith institutions particularly the Catholic Pastoral ministry in an effort to enhance the revaluation of the ecology. The researcher made the following recommendations:

- i. A holistic developmental approach should be emphasized and advocated for as it leads to the full integration of the person; physically, mentally, emotionally and psychologically besides the values of the culture in context. Development should not compromise the needs of the present generation with those of the future generation beside the capacity of the ecology to sustain life.
- ii. Church initiatives on political, economical and social justice should not sideline ecological justice. The church has the moral and ethical authority to advocate for moral and ethical conversion locally and internationally.
- iii. Human poverty is a reflection of ecological annihilation, hence the two co-exist. Poverty eradication should not be dealt with solely negating ecological management and sustainability.
- iv. The Catholic Church has in the theology of *imago Dei* principles which would enhance its ecological scheme. The time for integrating these principles into the Zambian context is now considering that the local Church has no elaborate ecological scheme in place.

REFERENCES

- Alibeb, S. (2000). *The Relationship between Traditional values and schooling: A case study of Education in Sudan, with particular reference to the Southern Sudan*. Masters thesis, Oslo University College.
- Apostolic Letter *Tertio Millennio Adveniente*, November 1994, No. 36
- Aquiline, T. (2010). 'The Role of Religion in Peace-building.' In *African Ecclesial Review: Reconciliation through Justice and Peace* 52, (1), pp385-401.
- Bless, C. and Higson-Smith, C. (2000). *Fundamentals of Social Research Methods: African Perspective*. Cape Town: Juta and Company Ltd.
- Bell, J. (1995). *Doing your Research Project: A guide for first time researchers in Education and science*. Buckingham: Open University
- Benge, M. (1977) 'Scientific Kaingin Management System' in *International Consultation on IPIL-IPIL Research*.
- Berry, T. (1988). *The Dream of the Earth*. San Francisco: Sierra Books.
- Berry T. (1999). *The Great Work: Our Way into the Future*. New York: Bell Towers.
- Best, J.W. and Kahn, J.V. (2009). *Research in Education*. New Delhi: PHI Learning Private Limited.
- Boff, L. (1995). *Ecology and Liberation: A New Paradigm*. New York: Orbis Books.
- Boff, L. (1996). 'Social Ecology: Poverty and Misery.' In D.G Hallman (ed) *Ecotheology Voices from South and North*, WCC, New York: Orbis Books.
- Brown, L.R. (1989). *State of the World: A Worldwatch Institute Report on progress Toward a sustainable society*. New York: WW Norton and Company.

- Bwalya, E. (2010). 'Trees' in *Speak Out*, 27, (3), pp 17
- Bryman, A. (2004). *Social Research Methods*. Oxford: Oxford University Press.
- Bujo, B. (1998). *The Ethical Dimension of Community: The African Model and the Dialogue Between North and South*. Nairobi: Paulines Publications.
- Burns, R.A. (1992). *Roman Catholicism*. Chicago: Loyola University Press.
- Changula, L.L. (2008). *Kasisi Agricultural Training Centre (KATC) Strategic Plan*. Unpublished document.
- Chenje, M. (ed). (2000). *State of the Environment Zambezi Basin 2000*. Maseru / Lusaka / Harare. SADC/IUCN/ZRA/SARDC
- Cheyeka, A.M. (2006). 'The Role of Religious Education in Ecology' in *Nkrumah Journal of Research in Education*. 32, pp 31-41.
- 'Climate Change an act of aggression' retrieved on 20th November from www.economist.com/world/Mideast/displaystory.cfm
- Cohen, L., Manion, I. and Morrison, K. (2007). *Research Methods in Education 6th edition*. London: RoutledgeFalmer
- Creswell, J.W. (1994). *Research Design: Qualitative and Quantitative Approaches*. New Delhi: Sage Publications.
- Dyer, G.J. (1975). *An American Catholic Catechism*. Minnesota: The Seabury Press.
- Encyclical *Populorum Progressio*, 1967, No. 22
- Environmental Justice in Catechism II. Retrieved on 3rd February 2010 from <http://www.scborromeo.org/ccs.htm>

Environmental Stewardship in the Catechism of the Catholic Church. Retrieved on 3rd February 2010 from <http://conservation.catholic.org/caldecott.htm>

Environmental Council of Zambia, (2001). “*State of Environment in Zambia 2000*” Lusaka: ECZ
Evangelium Vitae. Retrieved on 10th February 2010 from www.vatican.va

Exhortation, *Ecclesia in Africa*. Nairobi Paulines Publications Africa. 1995

Flannery, A. (ed). (1964). *Vatican Council II, Dogmatic Constitution on the Church, Lumen Gentium*. New York: Castello Publishing Company

Fortin, E.L. (1997). *The Bible Made Me Do It: Christianity, Science and the Environment in Human Right*. New York: Rowman and Littlefield.

Freire, P. (1993). *The Pedagogy of the Oppressed*. London: Penguin Books.

Gregg, S. (2003) ‘Dominion and Stewardship: Believers and the Environment.’ Retrieved on 3rd February 2010 from [http://www-acton.org/ppolicy/comment/article-
php?id=193](http://www-acton.org/ppolicy/comment/article.php?id=193)

Gaudium et Spes. Retrieved on 3rd February 2010 from www.vatican.va

Hallow, D and Munnik, V. (2008). *Wasting the Nation: Making trash of People and places*. Pietermaritzburg: Groundwork.

Hinfelaar, H.F (1994). *Bemba-Speaking Women of Zambia in a Century of Religious Change 1892 – 1992*. Leiden: E.J. BRILL.

Holborn, M, Burrage, P and Langley, P. (2009). *Sociology: Themes and Perspectives AS and A2 Level*. London: Collins.

<http://www.dnu.org/> . Retrieved 9th September 2009

<http://www.usccb.org>. Retrieved 9th September 2009

<http://www.vatican.va/messages/peace/document>. Retrieved 9th September 2009

Ilo, S.C. (2010). 'A Theology of Reconciliation: A Reflection on the Instrumentum Laboris for the Second Synod for Africa.' In *African Ecclesial Review: Reconciliation through Justice and Peace* 52, (1), pp 57- 65

John Paul II. (1989). *The Ecological Crisis: A common Responsibility*. World Day of Peace, December 8 1989, Post Synodial Apostolic

Kasisi Agricultural Training Centre (2010). Lusaka: Aquila Printers Ltd

KATC Student Attachment Guidelines 2010

KATC presentation, Agricultural and Commercial Show, 2010, 28 07 2010, unpublished

Ken, G. (1999). *God's World: A Theology of the Environment*. London: SPCK.

Keenan, M. (2000). *Care for creation: Human Activity and The Environment*. Vatican: Libreria Editrice Vaticana.

Kelly, M.J. (2010). *HIV and AIDS: A Social Justice Perspective*. Nairobi: Paulines.

Klein, C.R. and Dehsen, C.D. (1989). *The Genesis and Theology of Social Statements in the Lutheran Church in America: Politics and Policy*. Minneapolis: Fortress Press.

Kombo, D.K. and Tromp, D.L.A. (2006). *Proposal and Thesis Writing*. Nairobi: Paulines Publications.

Koshy, V. (2008). *Action Research for Improving Practice: A practical guide*. London: SAGE Publications.

Master, W.A, Alwang, J. Norton, G.W. (2006). *Economics of Agricultural Development: World Food systems and Resource use*. New York and London: Routledge.

Mbiti, J.S. (1982). *Introduction to African Religion*, London, Ibadan, Nairobi: Heinemann.

McBrien, R.P. (1994). *Catholicism*. New York: HarperCollins Publishers

McDonagh, S. (1990). *The Greening of the Church*. New York: Orbis Books.

McDonagh, S. (1986). *To Care for the Earth: A Call to a New Theology*. London: Geoffrey Chapman.

Message of His Holiness Pope Benedict XVI for the Celebration of the World Day of Peace 1st January 2007. Retrieved on 3rd February 2010 from www.vatican.va

Miles, M.B., and Huberman, M.A. (1994). *Qualitative Data Analysis: An Expanded Sourcebook (Second ed.)*. Beverly Hills: Sage

Ministry of Agricultural and Co-operatives: Soils and Research Branch: Adaptive Research and Planning Teams Annual Reports of 1986, 1987 and 1988.

Nalunnakkal, G.M. (1999). *Green Liberation: Towards an Integral eco-theology*. Delhi:

ISPCK/NCCI.

Namafe, C.M. (2006). *Environmental Education in Zambia: A Critical Approach to Change and Transformation*. Lusaka: University of Zambia Press.

Nyerere, J. (1968). *Ujamaa*. London: Oxford.

Ong'ong'a, J. (1999). 'Towards and African Environmental Theology.' In Getui, M. and Obeng, E.A. (eds). *Theology of Reconstruction: Exploratory Essays*. Nairobi: Action Publishers.

- Osei-Hwedie, B.Z. (1996). 'Environmental Protection and Economic Development in Zambia' in *Journal of Social Development in Africa*, 11, (2), pp 57-72
- Orodho, A.J. (2003). *Essentials of educational and Social Sciences Research Methods*. Nairobi : Masola Publishers
- Pope Paul VI. (1967). *Populorum Progressio*. CTS
- Pickering, K.T. and Owen, L.A. (1995). *An Introduction to global environmental issues*. New York: Butler and Tanner Ltd.
- Redemptor Hominis*. Retrieve on 3rd February 2010 from www.vatican.va
- Richards, A.I. (1959). *Chisungu A Girls Initiation Ceremony among the Bemba of Northern Rhodesia*. London: Faber and Faber.
- Richards, P. (1994). 'Theology of Life: Rebuilding from the Perspective of the South.' In Abraham, K.C and Mbuya-Beya, B. (eds). *The Spirituality of Third World*. Maryknoll, New York: Orbis Books.
- Roemer, M. (1982). *Economic Development in Africa: Performance Since Independence, and a Strategy for the Future*. Spring: Daedalus
- Rural Development; Brother Pual Desmarasi sj. Retrieved on 10th October 2010 from www.miseancara.ie/rural-rural-development-brother-paul-desmarasi
- Sampson, K. (2010). *Smallholder entrepreneurs: A key solution to African agricultural development*. Lilongwe: GRASP
- Santmire H.P. (1985). *The Travail of Nature: The Ambiguous Ecological Promise of Christian Theology*. Minneapolis: Fortress Press
- Shorter, A. (1973). *African culture and the Christian Church*. London: Geoffrey Chapman

Silengo, M. and Sinkamba, P. (2006) *Environmental Issues in the Mining and Quarrying Industry on the Copperbelt of Zambia: A Report for The Catholic Commission for Justice and Peace (CCJDP), The Development Education Community Project (DECOP), The Mineworkers Union of Zambia (MUZ) and The Zambia Congress of Trade Union (ZCTU)*. Netherlands Institute for Southern Africa

St Francis and Nature. Retrieved on 10th February 2010 from (<http://www.franciscans.org./spirituality/html>)

Speech delivered by His Holiness, Pope Pius XII, to the delegates at the Convention of the National Confederation of Farm Owner-Operators in Rome, November 15, 1946. Retrieved on 29 November 2010 from www.vatican.va

The International theological commission: *Communion and Stewardship*. Retrieved 9th September 2009 from www.vatican.va

Tempels, P. (1959). *Bantu Philosophy*. Paris: Pres Africaine

Timberlake, L (1994). *Africa in Crisis: The Causes, the Cures of Environmental Bankruptcy*. Nairobi: EAEP New Edition.

Todaro, M. (1992). *Economic For a Developing World: An Introduction to Principles, Problems and Policies for Development*. 3rd ed. New York: Longman Publishing.

Lesseps, R. (2002). 'Poverty Versus The Environment: A False Dichotomy' in *JCTR READER* (2008). 3, pp 30-31

Lubozhya, B. (2002). *What is the impact of GMOs on Sustainable Agriculture in Zambia*, Kasisi Agricultural Training Centre and Jesuit Centre for Theological Reflection.

Moore, J. (1997). 'Need for An Ignatian Ecology' in Jesuit Centre for Theological Reflection 32, (19), pp32-34

Mulongo, L.S. Kerre, P., Omboto, P.I., and Oseko, J.K. (2010). 'Natural Resources for Justice, Peace and Reconciliation' in *African Ecclesial Review: Reconciliation through Justice and Peace* 52, (1), pp 547-560

News from the Jesuit Social apostolate 2006/09. Retrieved on 3rd February 2010 from <http://www.Kiwi-us.com/news>

Royal, R. (1997). 'Use and Abuse of Religion in Environmental Debates.' Retrieved on 3rd February 2010 from <http://www.aei.org/event/seriesID.5/series-detail.asp>

Searson, C. and Chilufya, C. (2008). 'Thoughts on ways out of poverty' in *JCTR READER*. (3), pp 60-64

Sunday Post, 19th September 2010

The Post, March 28, 2007

The Post, August, 9, 2007

The Post, December 15, 2010

Wakarega, J.B.K. (2009). 'Responsible Stewardship of the Environment: Justice, Peace and Reconciliation' in *African Ecclesial Review: Reconciliation Through Justice and Peace*. 51, (1&2), pp 131-158

White, C. J. (2005). *Research a practical guide*. Pretoria: Ithuthuko Investment.

Wijzen, F and Tanner, R. (2000). *Seeking a Good Life: Religion and Society in Usukuma*, Tanzania. Nairobi: Paulines.

White, L.T. (1967). *Medieval History*, retrieved 9th September 2009 from <http://en.wikipedia.org/wiki/lynn>

World Bank, (1984). *Towards Sustained Development in Sub-Saharan Africa: A Joint of Action*. Washington, D.C: World Bank

World Resources Institute, (1996-97). *World Resources: The Urban Environment: A Guide to the Global Environment*. Oxford University Press.

Appendix i

UNIVERSITY OF ZAMBIA

DEPARTMENT OF LANGUAGE AND SOCIAL SCIENCE EDUCATION

QUESTIONNAIRE FOR SMALL SCALE FARMERS

(ZOFUNSA KUALIMI ACHING'ONO)

Dear Respondent,

The purpose of this questionnaire is to assist the researcher in finding out the role of Kasisi Agricultural Training Centre (KATC) in ecology. Your responses will be appreciated and treated confidentially. There is no right or wrong answer. You need not write your name.

Kwaotimvera:

Cholinga change pakukufunsani mafunso aya ndikufuna kudziwa pa dza kabungwe ka Kasisi Agricultural Training Centre (KATC) ndizinchito zimene kamachita pakuyanganira malo yano ndi zinthu zina monga manzi, mitengo, nthaka, nyama ndi kalimidwe. Kuyankha kwanu kudzakhala cisinsi pakati pa inu ndi ine ndipo ndidzakhala okuthokozani kwanbili.

General

Tick against the appropriate option. (*Chongani poenera*)

1. a) Age (*Zaka zakubadwa*) _____
- b) Sex: Female (*mkazi*) Male (*mwamuna*)
- c) Are you (*kodi ndinu*)
 - i. married (*okwathira*)
 - ii. single (*osa kwathira*)
 - iii. divorced / on separation (*olekana ndi amuna anu / akazi anu*)
 - iv. widowed (*ofedwa*)
- d) How many children do you have? (*muli ndi ana angati*)
 - i. one (*umodzi*)
 - ii. two (*awili*)

- iii. three (*atatu*)
- iv. four (*anayi*)
- v. five (*asanu*)
- vi. six (*asanu na umodzi*)
- vii. seven (*asanu na awili*)
- viii. eight (*asanu na anayi*)
- ix. nine (*asanu na anayi*)
- x. ten (*kumi*)
- xi. eleven (*kumi na umodzi*)
- xii. twelve (*kumi na awili*)

Other specify: (*Zina*)

2. a) What is your occupation? (*Mugwira nchito yanji*)

- i. farmer (*alimi*)
 - ii. charcoal burner (*kushoka malasha*)
 - iii. fisherman (*opaya nsomba*)
 - iv. hunter (*opaya nyama*)
 - v. black smith (*osula zisulo*)
 - vi. other specify (*Zina*)
-

b) For how long have you lived in this area? (*Mwakhalamo zaka zingati mumalo auno?*)

- i. 1- 2 years (*pakati pa chaka chimodzi ndi dzibili*)
- ii. 3 – 4 years (*pakati pa dzaka zitatu ndi dzinayi*)
- iii. 5 – 6 years (*pakati pa dzaka zisanu ndi dzisanu na chimodzi*)

iv. 7 – 8 years (*pakati pa dzaka zisanu ndidziwili ndi dzisanu ndidzitatatu*)

v. 9 – 10 years (*pakati pa dzaka zisanu ndi dzinai ndi kumi*)

Other specify (*Zina*):

c. which religious denomination(church) do you belong to? (*Mupemphera kuti*)

i. Catholic (*Katolika*)

ii. Seventh Day Adventist (*Sabata*)

iii. United Church of Zambia

iv. Methodist

v. Jehovah's witness (*Mboni Za Yehova*)

Other specify (*zina*)

d. what is your level of education? (*Maphunziro anu*)

i. Grade 1- 4 (*giredi 1 – giredi 4*)

ii. Grade 5 - 7 (*giredi 5 – giredi 7*)

iii. Grade 8- 9 (*giredi 8 – giredi 9*)

iv. Grade 10 – 12 (*giredi 10 – giredi 12*)

Other specify (*Zina*):

Part 1 (Gawo Loyamba)

1. In which ways does KATC help you? (KATC *imamuthandizani munjira yotani*); provides:

- a) Seeds (*mbeu*)
- b) Fertilizer (*feteleza*)
- c) Farming tools (*zolimirako*)
- d) Money (*ndarama*)
- e) Information on farming (*maphunziro azaulimi*)

Other specify (*Zina*)

2. How does KATC reach out to you? (KATC *amakufikani bwanji*)

- a) Classroom lessons (*maphunzilo amu klass*)
- b) Field demonstrations (*maphunzilo amu munda*)
- c) Extension work (*akaswili aza ulimi*)
- d) Donations / charity (*kulandila zaulele*)

Other specify (*zina*)

3. Of the services mentioned in question two (2) which one do you consider to be essential? (*pakati pazinchito dzili mufunso ya ciwiri, ndidzinchito zotani dzinzofunika kwambiri*)

- a) Classroom lessons (*maphunzilo amu klass*)
- b) Field demonstrations (*maphunzilo amu munda*)
- c) Extension work (*akaswili aza ulimi*)
- d) Donations / charity (*kulandila zaulele*)

Other specify (*zina*): _____

4. What have you learnt from the services provided by KATC? (*Mwaphunzila zotani kuchokela ku KATC*)

- a) Organic farming (*kulima kopanda feteleza*)
- b) Applying fertilizers (*kuyika feteleza*)
- c) Making tools (*kupanga zoguritsira nchito paulima*)
- d) Preserving trees (*kusunga mitengo*)
- e) The use of pesticides (*kugwiritsira nchito munkwala mulimi*)
- f) Recycling resources (*kulima kobwedzera*)
- g) To prevent water / land pollution (*kuletsa kuonongeka kwa madzi ndi nthaka*)

Other specify (*Zina*):

5. Is it easy for you as small scale farmers to access information concerning care for ecology from KATC? (*Kodi ndicapafupi kwainu monga alimi ang'ono kutenga maphunzilo pa zamalo anu, manzi, mitengo, nyama ndi nthaka?*) Yes (*Inde*) No (*Iai*)

6. If yes, how is this information accessed (*nagati muvomereza ndimunjila yotani imene mupunzililamo*)

- a) Classroom lessons (*maphunzilo amu klass*)
- b) Field demonstrations (*maphunzilo amu munda*)
- c) Extension work (*akaswili aza ulimi*)
- d) Donations / charity (*kulandila zaulele*)

Other specify (*zina*)

7. If no, what should KATC do to avail you with information on caring for ecology? (*Ngati mwakana, KATC ingacite bwanji kuti ikupatseni mapunzilo adza malo anu, manzi, mitengo, nyama ndinthaka*)
- a) _____
- b) _____
- 8 Which of the following factors do you think have contributed to the effectiveness of KATC's responsibility in ecology? (Rank the options 1- 5 in order of priority) (*Ndizotani padzinthu dzili pansi pa zimene zathandidza KATC kusunga bwino malo, madzi, nyama, mitengo ndi nthaka? (ikani mwandondomeko, 1 – 5 kulingana ndi ukulu wanchito)*)
- a) Co-operation between small scale farmers and KATC (*kugwiridzana pakati pa alimi aching'ono ndi KATC*)
- b) Dedication of the KATC staff to their work (*kudzipereka kwa a KATC panchito yao*)
- c) KATC makes follow-ups on the small scale farmers' projects (*a KATC amalondola nchito ya alimi ang'ono*)
- d) The services offered by KATC are essential for small scale farmers' awareness and participation in the protection of the environment. (*nchito yamene a KATC agwila niyoyenera pakudzindikiritsa ndi kudziikapo kwa alimi ang'ono panchito yosunga malo, nyama, mitengo ndi nthaka*)
- e) The projects of KATC help small scale farmers to sustain the environment (*nchito za KATC zithandiza alimi ang'ono kusunga bwino malo yao , manzi, nyama ndi mitengo*)

Part 2 (Gawo la chachiwiri)

1. a) Do you as farmers meet the KATC extension officers regularly to review your progress in ecological friendly agriculture? (*kodi inu ngati alimi ang'ono ang'ono a KATC muma komana nao akaswiri a KATC kuno pacitukuko ca nchito yu sunga malo, mitengo, manzi, nyama ndi nthaka? Yes (inde) No (iai)*)
- b) If yes, how often do you meet the KATC extension officers? (*Ngati mukomana nao akaswiri a KATC ndi kangati*)
- i. Daily (masiku onse)

ii. Weekly (sondo lililonse)

iii. Yearly (pa chaka)

Other specify (zina)

c) How have the knowledge and skills mentioned in question two (2) helped you to protect the environment? (maphunziro ndi ukaswiri onenedwa mufunso laciwiri kukuthandizani bwanji kusunga malo, mitengo, madzi, nyama ndi nthaka?)

i. _____

ii. _____

iii. _____

d) Why is it important to protect the environment? (ndichifukwa ciyani ndicofunikira kutetedza malo, mitengo, madzi, nyama ndi nthaka?)

i. _____

ii. _____

2. How do you rate your care for the environment? (kusamalira kwanu kwa malo, mitengo, madzi, nyama ndinthaka mukuwerengera pati)

i. Poor (koipa)

ii. Average (pakati kati)

iii. Improving (kusinthika kwakukula)

Other specify (Zine):

3. What indicators would you state to show that you are managing you environment in a sustainable way? (mungaonetse bwanji kuti muli kusunga malo anu, mitengo, nyama, madzi ndi nthaka bwino?)

- i. _____
- ii. _____
- iii. _____

Part 4 (Gawo lachinai)

1. What problems do you face in your role of preserving the environment? (*Dimabvuto otani amene mumapeza munchito yanu pakusunga bwino malo anu, manzi, mitengo ndi nthaka?*)

2. Suggest possible solutions to the problems faced in your environment? (*perekani maganizo anu pazimene mungacite kuthesta mabvuto amene mupeza pakusamalira malo anu, manzi, mitengo, nyama ndi nthaka?*)

UNIVERSITY OF ZAMBIA

DEPARTMENT OF LANGUAGE AND SOCIAL SCIENCE EDUCATION

QUESTIONNAIRE FOR PROGRAMME CO-ORDINATORS/ EXTENSION OFFICERS

Dear Respondent,

The purpose of this questionnaire is to assist the researcher in finding out the role of Kasisi Agricultural Training Centre (KATC) in ecology. Your responses will be appreciated and treated confidentially. There is no right or wrong answer. You need not write your name.

General

Tick against the appropriate option

1. a) Age _____
- b) Sex: Female Male
- c) Religious Denomination: _____
- d) Do you stay on the KATC compound? Yes No
- e) Are you
 - i. married
 - ii. single
 - iii. divorced / on separation
 - iv. priest/religious Brother
 - v. religious sister
- f) What is the highest level of your education?
 - i. School certificate
 - ii. College certificate
 - iii. College diploma
 - iv. Degree

v. Masters Degree

Other specify: _____

2. a) Which year was KATC established? _____

b) What inspired the establishment of KATC?

c) What are objectives of KATC?

d) For how long have you been at KATC as programme co-ordinator / extension officer? Programme co-ordinator _____ extension officer _____

i. How many small scale farmers does KATC enroll per course? _____

ii. How many Permanent employees work under KATC?

iii. How many of these employees are female: _____ Male: _____

Part 1(ONE)

1. a) Are your small scale farmers familiar with effects of ecological degradation in their area? Yes No

b) if no, how are you sensitizing them?

i. _____

ii. _____

iii. _____

c) If yes, how are you ensuring that small scale farmers prevent ecological degradation?

i. _____

ii. _____

iii. _____

d) What is the most appropriate method of reaching out to farmers on ecological issues?

i. Classroom lessons

ii. Field demonstrations

iii. Extension work

Other specify

e) Give reasons to your answer in 'd'?

i. _____

ii. _____

iii. _____

f) How often do you conduct sessions on ecological issues with regard to farming with small scale farmers?

i. Daily

ii. Weekly

iii. Monthly

iv. Yearly

Other specify:

2. What are the most prominent topics of your content on ecology in your contact sessions?

i. _____

ii. _____

iii. _____

3. What is the attitude of small scale farmers to the topics mentioned in '2'

- i. Positive
- ii. Negative
- iii. Lukewarm

Other specify:

4. What problems do you face in training small scale farmers in ecologically friendly agriculture?

- i. _____
- ii. _____
- iii. _____

5. How do you cope with the problems mentioned in '4' as programmer Co-ordinator / extension officer?

- i. _____
- ii. _____
- iii. _____

Part 2 (Two)

1. How do you rate the effectiveness of KATC's role in ecology?

- i. Poor
- ii. Average
- iii. Improving

Other specify:

2. In line with the objectives of KATC, what are some of the indicators of the effectiveness of KATC in ecology?

i. _____

ii. _____

iii. _____

3. Does the role of KATC in ecology appreciate some traditional values?

Yes No

4. If yes, specify the traditional values

i. _____

ii. _____

iii. _____

5. How are you as staff members developed in your appreciation of your role in ecology?

i. _____

ii. _____

iii. _____

6. a) Do you as KATC work with other organizations to further improve your role in ecology? Yes No

b) If yes, state the nature of work

i. _____

ii. _____

iii. _____

Part 3 (Three)

1. Suggest some strategies that would further help with the implementation of KATC's ecological courses / approaches / methods

i. _____

ii. _____

iii. _____