

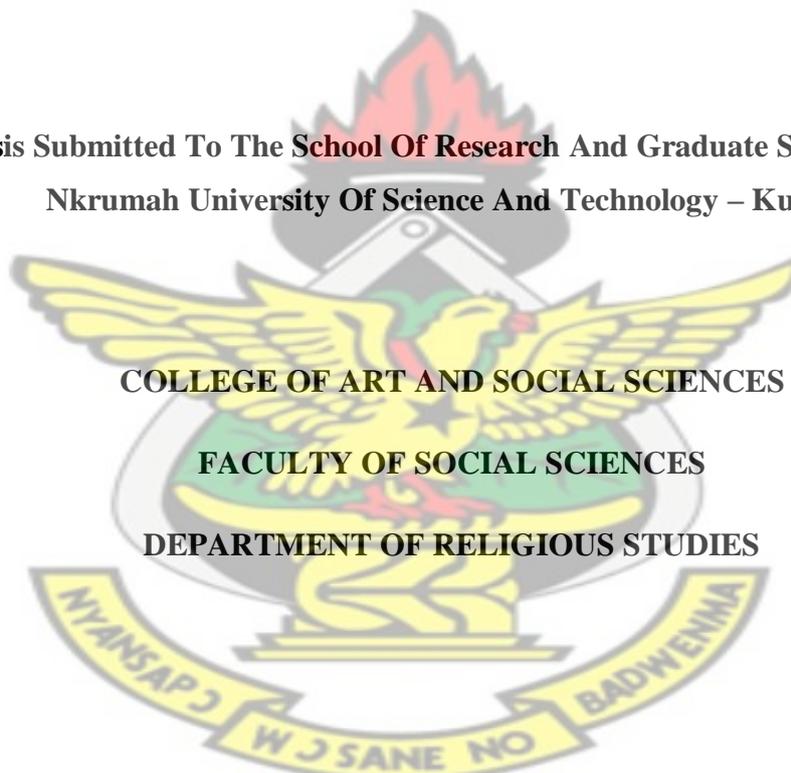
**A Religious Response To Environmental Degradation In Kumasi Metropolitan
Assembly And Ejisu – Juaben Municipal Assembly**

BY

Appiah, Ernest Simple,

**BACHELOR OF ARTS IN RELIGIOUS STUDIES
(EDUCATION MINOR)**

**A Thesis Submitted To The School Of Research And Graduate Studies, Kwame
Nkrumah University Of Science And Technology – Kumasi**



COLLEGE OF ART AND SOCIAL SCIENCES

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DEPARTMENT OF RELIGIOUS STUDIES

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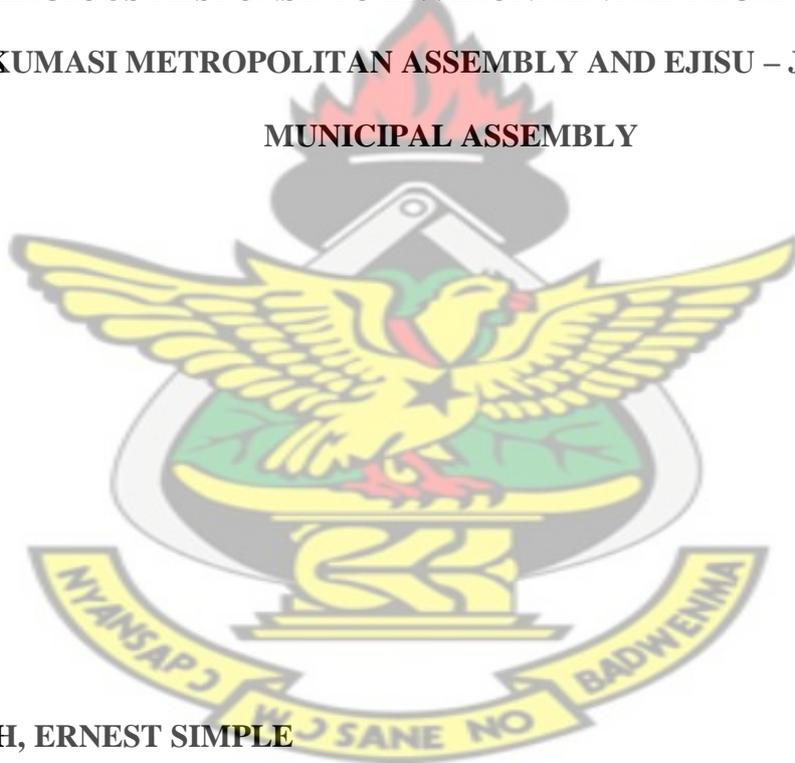
DEPARTMENT OF RELIGIOUS STUDIES

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A RELIGIOUS RESPONSE TO ENVIRONMENTAL DEGRADATION IN

KUMASI METROPOLITAN ASSEMBLY AND EJISU – JUABEN

MUNICIPAL ASSEMBLY



APPIAH, ERNEST SIMPLE

BACHELOR OF ARTS IN RELIGIOUS STUDIES

(EDUCATION MINOR)

DECLARATION

I, the undersigned, declare that with the exception of the sources specifically acknowledged in the thesis, this is the outcome of my own research in the subject under the supervision of Rev. Samuel Asiedu – Amoako.

This research includes nothing that is the outcome of work done in collaboration with others, and is not substantially the same as any that I may have submitted for any other course or degree qualifications, either now or in the past, either at Kwame Nkrumah University of Science and Technology or any other institution.

Appiah Ernest Simple Date

Student Name	Signature	Date
Student No.	20066028	PG2488108

Certified by:
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Supervisor(s) Name	Signature	Date
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Certified by:
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Head of Dept. Name	Signature	Date
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DEDICATION

This work is dedicated to my one and only son, Appiah, Sabbath Godfearing, my mother, Comfort Serebour and all my sisters and brothers, Grace Appiah, Joyce Appiah, Portia Amoah, James Amoah, and Francis Appiah for their moral support.

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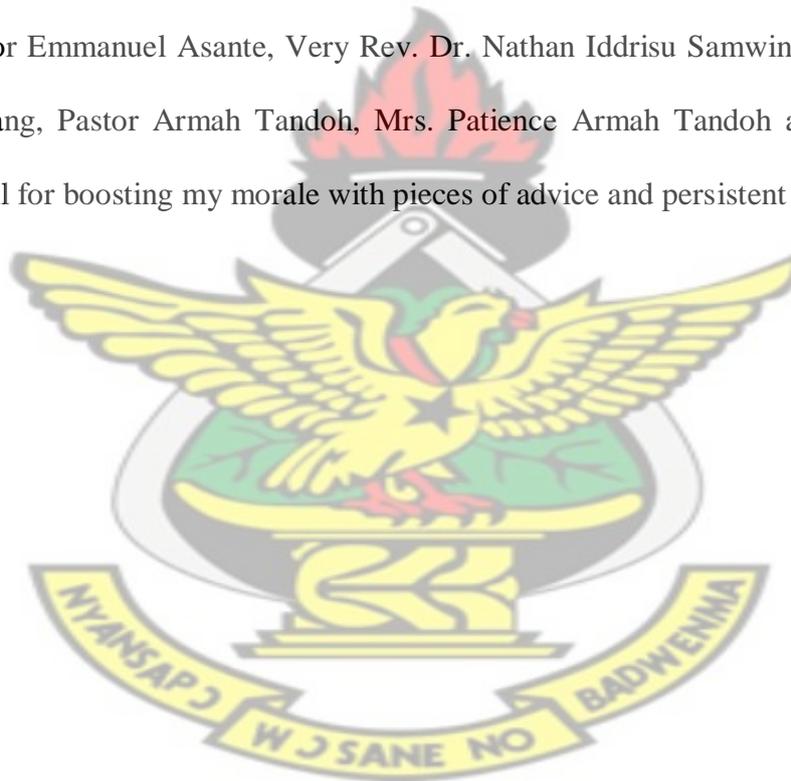


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I am also thankful to my Godfearing, chirpy, indefatigable and knowledgeable supervisor, Reverend Samuel Asiedu – Amoako for supervising the thesis for me. Admittedly, had it not been for his encouragement, I would have stopped somewhere along the line.

Consequently may God shower his blessings on Rev. Dr. Opuni Frimpong, Most Rev. Professor Emmanuel Asante, Very Rev. Dr. Nathan Iddrisu Samwini, Pastor Samuel Agyemang, Pastor Armah Tandoh, Mrs. Patience Armah Tandoh and S[b] Nyame Maxwell for boosting my morale with pieces of advice and persistent prayers.



ABSTRACT

This long piece of writing brings to light a religious response to environmental degradation in the Kumasi Metropolitan Assembly and Ejisu – Juaben Municipal Assembly. It pinpoints the causes of the ecological crisis that is currently on the rampage in the two study areas and how they can be curtailed and managed effectively. This thesis states emphatically that environmental degradation is human-induced and therefore postulates the following:

Christians' understanding of stewardship, exploitation of nature by Christians, refusal to condemn environmental destroyers outright, poor management of nature, human population growth, spiritism, poor interpretation of the gospels, noise, frequent shortages and high prices of liquefied petroleum gas, bad gases, refusal of sand and stones winners to reclaim the land, inability to implement the environmental rules prescribed by the prophet, agrochemicals, modernity, concessionaires, chain sawing, leachates, Christians' understanding of the ecological triangle, technological advancement, relegation of farmers to the background, improper waste disposal and the use of pestles, mortars and canes.

Now, since environmentalists have explored all avenues to curb the crisis and it's still going on, this thesis recommends religion as the final arbiter because the three main religions (Christian, Islamic and Traditional) in Ghana teach how humans should be treated and how humans should relate to nature. These religions provide basic interpretive stories of who humans are, what nature is, where humans have come from and where they are going. It attempts to use the multi-faith principles in the study areas to provide lasting cure-alls for the ecological crisis confronting the inhabitants. This thesis tries to accentuate the three main religions in the study areas because they consider environmental destruction as a sin against God, humans and nature. It teaches that it's only religion that can lead people to be circumspect as far as environmental issues are concerned without any circumvention. It is defined by some people as: The life of God in the soul of man, the conservation of values etc.

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CHAPTER ONE

BACKGROUND TO THE STUDY

1.1 INTRODUCTION

The issue of environmental degradation has become a matter of concern to all Ghanaians. Since 1983, environmental issues have come to the forefront of national agenda. More and more people throughout the world are worried about the way the natural environment is being harmed and destroyed. The earth's biological systems such as food chains and habitats and its physical systems such as the water cycle and the ozone layer are being harmed by what people do.

Environmental degradation involves air pollution, water pollution, noise pollution, erosion, forest depletion, and desertification. It is a problem of humanity. That is a problem created by humankind. It is largely a by-product of human action. Breuilly and Palmer have noted that environmental destruction is not only a danger to us all, it is a sin against God (1992:2).

An environmental degradation is also an environmental crisis. For many people, an environmental crisis is not only the result of certain economic, political and social factors. It is also a moral and spiritual crisis which requires a broader philosophical and religious understanding of ourselves as creatures of nature, embedded in life cycles and dependent on ecosystems. This is because religion helps to shape our attitudes toward nature in both conscious and unconscious ways. Religion provides basic interpretive stories of who we are, what nature is, where we have come from and where we are going. Religion also suggests how we should treat other humans and

how we should relate to nature. (Hessel and Ruether, 2000).

Religion generates worldviews and ethics which underlie fundamental attitudes and values of different cultures and societies, of which Kumasi Metropolis and Ejisu-Juaben Municipal Assembly are no exception. Lynn White has observed: "What people do about their ecology is deeply conditioned, by beliefs about our nature and destiny- that is, by religion" (1967:1204).

Religion still remains a key instrument in shaping attitudes towards nature. It is in this context that this research is being undertaken to critically examine how the religion of the people of Kumasi Metropolis and Ejisu-Juaben Municipal Assembly could be tapped to re-orient themselves towards a cosmic community and integrity of creation (Young 1994:62).

1.2 STATEMENT OF THE PROBLEM

There are several factors that contribute to the environmental degradation in the Kumasi Metropolis and Ejisu-Juaben Municipal Assembly of the Ashanti Region. The environmental degradation which points to an environmental crisis has a relationship between issues of development and modernity in our society and the physical and the biological environment.

Development and modernity usually result in the destruction of the environmental quality. This problem is by and large human-induced. Economic activities have contributed to pollution, deforestation and abuse of the environment. Economic activities are environmentally polluting and nature-destructive. Any environmental behaviour that takes away from the natural environment without replacing what has

been taken away in the name of progress, modernity and development will certainly create an environmental crisis. Nature should not be sacrificed to satisfy only human needs and endless wants (Young 1994:14). If environmental degradation affects the health of the people, the economy and the political stability of the country and also affects the basic existence of humanity, then the following research questions would demand for positive responses: How do we embark on development programmes without degrading the environment? What should be done to create an environmental quality that could sustain all life forms? What development strategy would be adopted to create sustainable development without degrading the environment? The study will also search into our context to discover religious and cultural resources that could be harnessed towards sound environmental management. Consequently, the following objectives are set:

1.3 OBJECTIVES

The objectives are:

1. To identify the environmental problems facing the people of the Kumasi Metropolis and Ejisu-Juaben Municipal Assembly.
2. To discuss the role of religion in the environmental debate.
3. To undertake a general discussion on how to create a clean environment in the Kumasi Metropolis and Ejisu-Juaben Municipal Assembly.

1.4 SIGNIFICANCE OF THE STUDY

There are a number of reasons for undertaking this research: The first is existential. The harm that environmental degradation can pose to the people of the Kumasi Metropolis and Ejisu-Juaben Municipal Assembly is unimaginable. When the environment is destroyed, all humanity and the biodiversity are affected. Environmental degradation could reduce crop yield, reduce the vegetation cover, and also reduce the resilience of land to climate variability.

Secondly, the study would provide information about environmental degradation for Kumasi Metropolis and Ejisu-Juaben Municipal Assembly and serve as a source of knowledge on environmental decision-making, planning and management of the ecosystems within the study areas.

Lastly, the study will engage religion in developing ethical and moral dimensions of the environmental debate toward a sustainable development approaches by the people of the Kumasi Metropolis and Ejisu-Juaben Municipal Assembly.

1.5 RESEARCH METHODOLOGY

Both primary and secondary data were collected for the research. Libraries were used to collect data from relevant books, dissertations and long essays. The following research methods were used.

First, was to review relevant literature on environment, ecology, environmental ethics and any educational materials that treat environmental issues from the general perspective:

The second was to design questionnaires which would be used to interview people within the study areas. The data collected were qualitatively analyzed, discussed and conclusions made from the view point of respondents.

Questionnaires were sent to bodies or agencies that dealt directly with the environment. Hence the Environmental Protection Agency's offices in Kumasi and Ejisu were visited to seek relevant information that guided the research. Field work involved one-to-one interviews of the people of the Kumasi Metropolis and Ejisu-Juaben Municipal Assembly. The questionnaire focused on causes, nature and the development of the environmental degradation in the Kumasi Metropolis and Ejisu-Juaben Municipal Assembly. There was a participatory approach that helped the researcher to interact directly with the local people, the victims of environmental degradation, who told their own story; the way they perceived and used the environment.

1.6. SCOPE OF THE STUDY

The study is limited to identification of the environmental problems in the study areas, their causes, negative effects, solutions and recommendations, with special emphasis on the religious (Christian, Islamic and Traditional) ones.

1.7 LIMITATIONS

The research anticipates encountering some difficulties in getting people to respond quickly to interview questionnaires. Some respondents may accept questionnaires but will not make time to respond to the questions. Others might demand financial rewards before responding. All these would be financial

constraints on the researcher. There is also a risk factor in travelling to the research areas.

1.8 LITERATURE REVIEW

The day-to-day activities of human beings are now turning into a global aggression against the very foundations of life on Earth. The natural environment is deteriorating very fast; on account of this, many people have written about the natural environment in order to draw the attention of humans to their long-term effects and how they may be curbed.

Stott (1999) writes about problems that environmental pollution creates for humanity. He further notes that the greatest threat to the human race is environmental rather than nuclear destruction. He mentions four things that are working together to destroy the natural environment as rapid population growth, resource depletion and biodiversity, waste disposal and atmospheric damage which results from poisonous chemicals to the atmosphere which depletes the protective ozone layer. He explains that these causes are related to one another and constitute a single “interlocking global crisis,” (1999:124-130). He therefore calls on Christians to do something to help solve the environmental problems facing humankind but he fails to mention the specific roles that religion may play in the fight against environmental degradation which the researcher attempts to look at.

White (1988) blames Christianity for the deterioration of the natural environment because of its attitudes towards nature. He supports his argument with the following reasons:

- That Christianity's victory over animism makes them look down upon nature and therefore takes away the restraints that prevent people from treating nature badly. Since many Christians believe that animals and plants do not have spirits, and therefore their destruction may not create problems for them spiritually, they may be tempted to handle and use them irresponsibly.
- That according to Genesis, the main purpose of nature is to serve human needs.
- That humankind's transcendence over nature gives them the right to manipulate it to suit their own interest.

Nevertheless his religious response may not be enough to curtail all the environmental problems in my study areas because he fails to conscientise Christians for them to know that animals and plants have the right to exist and have spirits and a role to perform in environmental protection.

Young (1994) explains that if the Christian view of nature is interpreted rightly from scripture, none of the issues raised by Lynn White would be accepted. He argues that the Bible has a lot of ecological wisdom but they were relegated to the background by the protestant tradition in the West. He believes that if the Christian view of nature is interpreted through the Theo-centric framework, we may get a very reliable alternative to analyse and resolve the environmental problem. The Theo-centric framework teaches that, "God is the centre of the universe and that He alone is the source and upholder of meaning, purpose, value and ethics, as well as the unifying principle of the cosmos. Everything finds existence, value, purpose and meaning in the infinite and transcendent God. His

response to Lynn White was appropriate but we believe that a combination of indigenous knowledge of conservation and some Theo-centric principles could solve the ecological crisis in Ghana.

Miller, Reid and Barber (1991) note that the world's forest was destroyed right from the time large scale agriculture and human settlement started. According to them, the destruction has continued until now and that if humans do not change the current deforestation trends, about 25 percent of all species inhabiting the earth will disappear by 2015. We agree with these writers that forests contribute directly to human survival as sources of food, fibre, medicine, industrial products and the genes to breed the improved crop varieties upon which the world's food security rests. Although these writers raise alarm concerning the world's deforestation they fail to recognize the role of religion in the deforestation debate which the researcher intends to look at.

Ricklefs (1996:6) states that because the levels of carbon dioxide, methane and CFCs have increased in the atmosphere, the earth's climate is changing. He thinks that such a change will cause a rise in sea level because the polar ice caps will melt and disrupt agriculture and shift ecological habitats across the landscape. He ends by saying that some forms of life that would not be able to adjust to the change and its effect may become extinct. As an environmentalist he suggests several ways to curb environmental pollution but he overlooks the role of religion in the environmental debate which is the missing link the researcher wants to look at.

Asante (2001: 25) considers the place of the land in African and Biblical spirituality. He explains that the human's claim to the land, the cultivation and harvesting of the land and its produce is subject to God's direction and to His absolute ownership of the

land. He further notes that the traditional African conception of the earth is that it is sacred, not because it is a god but because it owes its being, its animation, its sacred quality to God, the Creator-Animator who creates and animates nature. Although, in both religions, Asante says that there seems to be a spiritual relation between the people and the earth, His response is positive and could provide some solution to the environmental problems in our days.

Otto and Towle (1985:704) have observed that every organism is the product of its environment. They explain that an organism cannot survive if the environment does not provide conditions that are suitable for maintaining life. They raise issues on environmental pollution but they do not consider the role of religion in the environmental debate which is an area we would like to research into.

Mante (2004:7) does not understand why the non-human environment which plays a larger role in Africa should be ignored when theologizing. To him, the non-human environment pervades all African symbolic thoughts and worldviews. He also says that the current destruction of the ecosystems should be taken seriously in our theological construction. According to him, faulty protestant theological anthropology, which does not only distinctly separate human beings from nature, but also sets the human being over and above nature is not good for Africans. Mante emphasizes the need for humans to live in harmony with the non-human environment. We agree with him in raising this religious response to help solve the ecological crisis to some extent. We think until Africans will go back to use totemism, punishments, restrictions, taboos and holidays to prevent people from destroying the environment, destruction of nature will continue.

A Moslem scholar, Alhilaly (1993) has indicated that the Prophet Mohammed had ecological wisdom. He reports the Prophet as saying, "one who revives dead land, the land becomes his (that is if someone plants on barren land which was not owned by any body, and is not being used, he will have legal title to this land) and whatever eats from it causes a reward from God for the cultivator of the land". Tajuddin further notes that one of the traditions speaks against people who kill birds for pleasure because birds can ask Allah to punish their killers on the day of judgement. (Keysar tradition, <http://www.Speednet.com.au/~keysar/ecology.htm> (Accessed March 17, 2009).

It appears if Moslems will abide by this religious injunction they might save themselves and many other people on earth, but surprisingly the reality of this is that many Moslem communities in Ghana are treeless and polluted.

In the Ghana statistical service report (2005) genuine concerns have been raised about the rapid population growth rate of Ghana and in particular the Ashanti Region. The Kumasi Metropolitan Assembly and the Ejisu-Juaben Municipal Assembly have experienced rapid population growth resulting in environmental degradation. In spite of the sensitization carried out by E.P.A. and by some religious bodies, the people continue to pollute the sources of drinking water, fell trees, and throw waste about carelessly. Gutters are choked with waste disposals and most markets are unclean.

Dianne (2002) laments that the global environment is changing but she thinks it is human beings who have greatly accelerated it. The book deals with environmental problems and challenges that face humanity and the mechanisms that can be adopted

to solve them. It also teaches humans what they should do in order to make life better and enjoyable on this biosphere but what it does not touch on is the role of religion.

Dauda (2009) states that this nation will lose all its forests by 2025 if the rate at which the trees are being felled is not curbed. Earlier in September 2009 he had advised the newly reconstituted eight-member board of the Forestry Commission to embark on forestry plantations. According to Dauda, the estimated 1.6 million hectares left in Ghana will be depleted in the next 23 years if measures are not put in place. He speaks against illegal forestry activities like chain sawing, wild fires, encroachment and farming. He emphasized the determination of government to enforce environmental laws in the country.

Ongong'a (2003:4) thinks the fact that many people have been talking about conservation, pollution and deforestation indicate that something is happening to our biosphere. He speaks about the continuous destruction of our life-support systems and adds that our world is more threatened than it was, even during the two world wars. He mentions population growth, resource depletion, runaway technology and atmospheric damage as the reasons why the environment is dwindling. He discusses how Africa can use its religion to solve the environmental problems so we share his thoughts and wish to borrow more from him in this thesis.

Gecaga (2003) defines ecology as "... that branch of biology which deals with the relation of living organisms to their surroundings". She asserts that it is an emerging discipline which combines insights from many sciences like: Genetics, Biochemistry, Zoology, Chemistry and Geography. The factors that she thinks lead to ecological degradation are technology, the arrogance of the technological personnel, skewed

values and visions of society. She talks about authors who have attributed the anthropocentric and aggressive attitude towards nature to the Christian idea of human sovereignty over all other creatures.

She ends by saying that stewardship involves accountability so we are all answerable to God for the way we manage this world during our time here and now. This in her opinion suggests an active and creative role in respect of the earth for which we have been given responsibility. We will borrow some thoughts from Gecaga to enhance our work.

Manjunath (2007) points out that only planet on which liquid water is found on the surface is the earth. He also asserts that it is the only place in the universe that supports life. He argues that the earth's dimension and composition and its surface characteristics must be studied so that its environment will be very well understood. He writes that since human beings cannot exist in isolation, it is necessary to deal with the environment of all life forms.

Grebe and Fon (2006) think that the religions of Africa are different in details but in terms of essentials like the spiritual nature of the world, the existence and mystical powers and the way man relates to his world and God do not vary. They explain that its ethnographic studies have indicated that in all cases the religion of African peoples is at the very heart of their cultures and it controls much of their social systems. It is the main source of power and regulates matters relating to the land and the weather on which most Africans depend for their survival. We agree with this assertion. Even though they have tried to explain to us how religion impacts on Africans, they do not exactly state how the African religion can be used to protect the environment.

Sarpong (1974) also elucidates that traditionally the Ghanaians lay much store by his religious beliefs and practices. Religion permeates every aspect of his life. Religion, for him, is everything. When the traditional African sees nature, they have seen God so the environmental problems in the study areas may be reduced if the traditionalists come out to explain to the people how totems, taboos, holidays, restrictions etc were used to protect nature in the past and why they are still binding today. We believe that people who link their faith with whatever they do should be made leaders in the campaign against environmental destruction in the study areas.

Opoku (1978:52) explains how our predecessors used their own methods to preserve the environment. He believes that preservation of the natural environment is a very vital part of the culture of the people. According to him, the traditional African reveres nature. He says that in order to enforce that reverence, many prohibitions were used and we think they may be introduced again in the study areas through the various chiefs.

Otim (1992) has also stated that Africa is in ecological crisis but all efforts to solve the problems and normalize them have not been effective enough to return the situation to normalcy. Otim has also based on the continuous degradation of agricultural lands, the destruction of rainforests, the increasing loss of biodiversity and uncontrolled urban, industrial and rural population growth to establish that there is ecological crisis in Africa and Ghana is not an exception.

His opinion is that the continuous degradation of the natural environment has now had negative effects on human health, aquatic life, food production and global climate. He establishes once again that although there is pressure on governments,

non-governmental organizations and communities to protect the natural environment and introduce sustainable development, the progress made so far is insignificant.

Manu (1992) is of the view that traditional religious systems are present in every part of African life and they influence the way the people understand and interact with their environment and community. In his opinion, balanced relationship between nature, culture and religion favoured the judicious use of human and natural resources. He thinks it is totems and taboos that Africans used to protect their plants and animals. He added that rivers, forests, caves and burial grounds were all protected because the people referred to them as sacred areas that needed to be revered and protected.

Edwards (1998) believes that one of the important resources that can help solve the environmental problems is religious faith because it can provide an ecological ethos and a foundation for an ecological ethics. He also believes that the central task of Christian theology in our time should manifest the ecological dimensions of the Christian tradition. He also asserts that many people have now understood clearly that love and respect for God should lead to love and respect for what God has created. Edwards accordingly suggests these two aspects of the Christian theology of God as the understanding that God is relational and the concept of God as self expressive can provide the best theological foundation for an ecological praxis. We share the thought of Edwards, but we think he should have been specific because it is not every religion that believes in ecological principles.

1.9 ORGANISATION OF THE THESIS

The research would have six chapters:

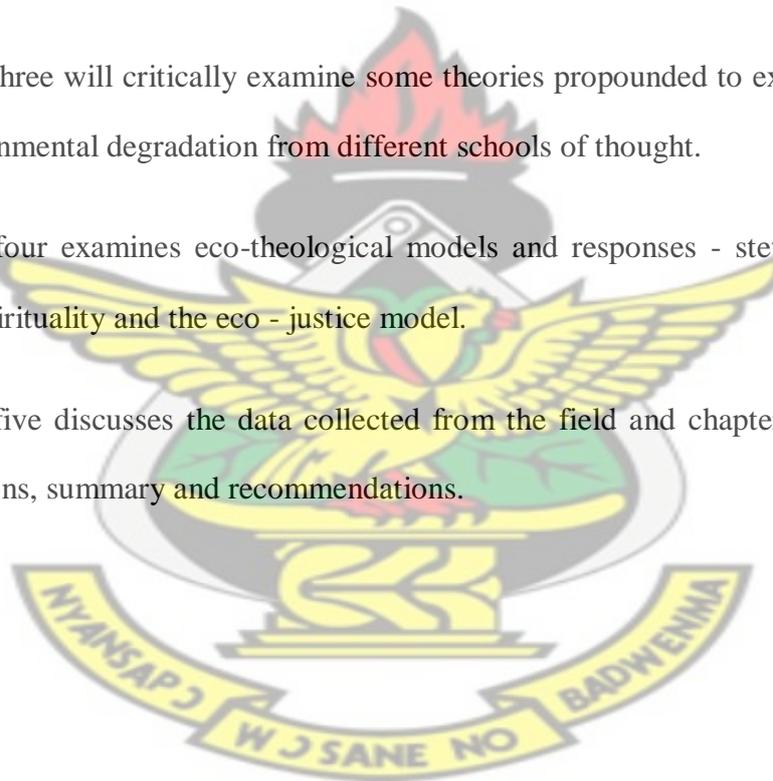
Chapter one will discuss the introduction, statement of the problem, objectives, significance of the study, research questions, methodology, the scope of the study, limitations, organization of the study and literature review.

Chapter two will also 'deal with humankind in the natural environment. The chapter will discuss environmental concerns, environmental crisis and environmental degradation.

Chapter three will critically examine some theories propounded to explain the causes of environmental degradation from different schools of thought.

Chapter four examines eco-theological models and responses - stewardship model, nature spirituality and the eco - justice model.

Chapter five discusses the data collected from the field and chapter six will be the conclusions, summary and recommendations.



CHAPTER TWO

THE HUMANKIND IN THE NATURAL ENVIRONMENT

2.1 Introduction

The humankind within the environment should have both environmental concerns and ecological orientation in order to have positive attitude towards the environment.

In this chapter an attempt will be made to critically examine the attitude of the people of the Kumasi Metropolitan Assembly and the Ejisu-Juaben Municipal Assembly towards the environment.

2.2 Our Common Environmental Concerns

An environmental concern implies a feeling or a worry about the environment in which one lives. One should not only have a feeling or a worry towards the environment in which one lives in but a positive, constructive and sustainable attitude. According to Manjunath (2007), the environment essentially comprises our immediate living ambience, which gives us the zest and verve in all our activities. It seems to me that the Kumasi Metropolis and the Ejisu-Juaben Municipality have experienced the gradual destruction of the environment as a result of human activities.

2.2.1 Ecological Orientation

An ecological orientation is a philosophical orientation that requires that the existence of an entity should be conceived in terms of a symbolic relationship with its environment (Mante, 2004: 45). This mode of existence recognizes that all entities in

an environment are thoroughly related, both in terms of inner relations and external relations. Hence, to be ecologically oriented implies that a person must be able to think also of internal relations as regards to the constitution of an entity within a given biosphere.

2.3 The Issue of Environmental Concerns in the Kumasi Metropolis and the Ejisu- Juaben Municipality

As a result of increasing environmental degradation within the research areas, many concerns have been raised by many well-meaning Ghanaians including chiefs, opinion leaders, government and non-governmental agents, the church, the academia and the environmental protection agency (E.P.A.) for the immediate reverse of the situation and steps that have to be taken to achieve sustainable development. Many respondents think that the environmental degradation within the Kumasi Metropolis and the Ejisu-Juaben Municipality can be stopped because it is human-induced. According to John Stott both the rich and the poor are culprits of environmental degradation. He notes, "The wealthy consumes too much and are wasteful, while the poor are preoccupied with their immediate survival, rather than with the long-term care of the planet (1999:125). Jessica also observes that environmental degradation is a survival issue (1991: 16). Many ethical questions are raised when environmental degradation is tagged "survival issue". Does it mean that those who destroy the natural environment in order to survive have a justifiable reason?

Ghana's State of the Environment Report 2004 states that "the country has serious environmental problems" (2004 SOE 2004: 1). These include land degradation, erosion of all forms, pollution of rivers, streams and lagoons, deforestation,

desertification and waste management. The Kumasi Metropolis and the Ejisu-Juaben Municipality are no exceptions. In the Kumasi Metropolis, sheer numbers of human beings are causing severe damage to the environment. For example, because of humans, plastic waste has become a big menace and a challenge to government and local government authorities (K.M.A.). The physical system such as the water cycle and ozone layer are being harmed by what people do. Within the study areas, the loss of vegetation cover due to farming activities, lumbering, clearing of sites for building projects have serious consequences on the integrity of habitats and species diversity, water resources, environmental quality and stability generally (Agyapong, 1996:125)

A summary of Ghana's environmental problems noted by Nsiah Gyabaah best depicts the environmental situation within the Kumasi Metropolis and Ejisu-Juaben Municipality.

Ghana's environment is suffering the effects of climatic changes; its forests are being degraded into savanna, and the savanna areas are fast turning into deserts. The invasion of the forest through over cultivation, forest clearing and overgrazing has been worsened by extreme changes in climate ... vegetation has become so impoverished that it is difficult for the forests to recuperate even with the onset of rains. (1982:80)

The Environmental Protection Agency of Ghana has noted that the environmental degradation is a reality and is accelerating on all fronts (E.P.A., 2004:6). The problems that humanity will face when the environment is destroyed have incited a passion in the researcher to research into conservation, preservation and sustainable

management of the environment.

2.4 Ecology and Ecosystems

The word "ecology" is derived from two Greek words "oikos" meaning home or house, and "logos" meaning reflection or study. Leonardo Boff defines ecology as "the science and art of relations and of related beings" (1993: 11). He concludes that ecology means "the study of the conditions and relations that make up the habitat (the house) of each and every person and, indeed organism in nature (1993 :9). Tim Cooper also defines ecology simply as "the study of the structure and function of nature" (1990:9) and adds that from the Christian perspective, ecology is an exploration of how this structure and function of nature fit into God's purpose (1990:10).

McDonough quoted Commoner as saying that "the basic and primary law of ecology (or the house) is the interconnectedness and interrelatedness of all living and non-living forms" (1985:18).

Each species contains a unique genetic code, and it lives in a certain habitat, often requiring very specific conditions for life (Quirk, 2007:185). The concern of ecology and ecosystem within the research area is not only the destruction of the natural environment but also the extinction of species and the rate at which human intervention is destroying the interrelatedness and interconnectedness of all living and non-living forms

2.4.1 The Ecosystems

Richard Young defines an ecosystem as "the sum total of the living and non-living

parts that support a chain of life within a given area (1994:53). Ecosystems are composed of community of organisms that thrive in a particular set of conditions. The Kumasi Metropolitan Assembly and Ejisu-Juaben Municipal Assembly have different kinds of ecosystems. Broadly speaking, one can identify two ecosystems, namely: Terrestrial Ecosystem and Aquatic Ecosystems

2.4.2 Terrestrial Ecosystems

Within the Kumasi Metropolitan Assembly and Ejisu-Juaben Municipal Assembly, one can identify types of Terrestrial Ecosystem. A Terrestrial Ecosystem involves those that encompass the activities that take place on the land. Examples of Terrestrial Ecosystem include the forest, mountain, grassland, marshland and urban ecosystems.

2.4.3 Aquatic Ecosystems

Aquatic ecosystems involve all activities that exist in water bodies. Under the jurisdiction of the study area, one can identify fresh water ecosystems and marshland ecosystems. Typical examples are River Oda and River Subin and the areas of soft wet land at Besease, Donaso and the Golden Tulip Hotel.

2.4.4 Engineered Ecosystem

This is also an ecosystem that is fully designed and controlled by humankind. A paddy field ecosystem, forest reserve ecosystem and fish pond ecosystem are all examples of engineered ecosystem. With each ecosystem, there is a mutual dependency between the various organic and inorganic components that form complex food chains and life-support systems (Young, 1994:53). The field of rice growing in water at Besease, near Ejisu, the Bobiri Forest at Kubease and the pond

off the Abankuro road are all examples in the study areas.

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BIOPHYSICAL ENVIRONMENT OF KUMASI METROPOLIS AND EJISU JUABEN MUNICIPALITY

2.5 Introduction

We will attempt to critically examine the biophysical environment to discover the impact of human activities on plants, animals, and non-living components including mineral and water resources. We will examine the picture of the bio-physical environment given by the survey department some fifty years past.

2.5.1 Vegetation

It is often said that when the last tree dies, the last man dies. It looks as if many people are now attaching importance to tree planting but in reality deforestation is on the increase. If humans have realized that they cannot live without trees then they must protect them. Amanor has observed that the country has experienced rapid rate of deforestation as a result of farming and logging, If this cycle of event continues unchecked it is estimated that many timber species will become scarce and Ghanaians will be the losers or victims. (1997:24).

Nsenkyire (1997:6) has noted that forests play an indispensable role in the economy of Ghana and that; over the years, timber that has been harvested and processed from Ghana's forests has been contributing about 6% of the Gross Domestic Product. He explains that in 1994, foreign exchange receipts from timber reached the level of \$250million. He postulates that Ghanaians take good care of the forests because forests contribute significantly to rural livelihoods in the form of non-timber forest products. Examples that may be given here are mushrooms, fruits, herbs, game and

many others, which are common in the Ejisu-Juaben Municipality.

2.5.2 Contribution of Forests towards Environmental Stability

Because the people in my study areas have now worked out that forests have many indispensable roles to play, they have created some engineered ecosystems like the trees behind the Golden Tulip Hotel in Kumasi, in front of the Forestry Research Institute of Ghana, Fumesua and at the back of the Kumasi Children's Park. We think they are not enough as compared to the number of areas that are treeless. Forests prevent erosion, promote transpiration, create the environmental blanket that promotes agricultural production, serve as carbon sink and safeguard the biodiversity.

Amanor (1997:24) attests to the above assertion and expatiates that trees help to maintain the agro-ecosystem by promoting fertile moist soils, encouraging rainfall, shading out pan-tropical weeds and savannah grass species, protecting the land against bush fires, preventing streams from drying up by conserving watercourses and watersheds and protecting farmland from windstorms which can destroy crops like plantain and houses in villages.

2.5.3 Tree Harvesting

All over Ghana, chiefs, religious leaders, politicians and opinion leaders are worried about the rate at which timber is being harvested within the forest zones. It appears the quest for agricultural lands, timber exploitation and urban expansion has resulted in deforestation within the study areas. It was realized during the field work that Kumasi did not deserve to be called the Garden City of West Africa again because of the rate at which its trees had dwindled.

Nsenkyire (1997:7) laments that the sizeable quantities of timber remaining on farms and fallow lands are now being cut at a rate so alarming that most Ghanaians have advocated for a complete ban on the felling of timber. According to him, it's lamentable because available records indicate that 75percent (880,000m³ in 1996) of the total harvested timber came from off-reserves. He finishes off by commenting that since only a small portion of that area is still forested, it can only be concluded that timber exploiters especially chainsaw operators, are cutting irresponsibly and do not care whatsoever about the future supplies of timber.

2.5.4 Drawbacks of Forest Loss

Indiscriminate felling of trees in my study areas have become so rampant that trees are hardly seen. Concessionaires and chainsawyers have almost felled all the trees in areas like Fumesua, Kwamo, Ejisu and have now moved to the towns and villages around Juaben and other parts of the municipality.

The disadvantages of tropical forest loss as far as Miller, Reid and Barber (1991:79) are concerned are climate change, reduction of water vapour into the atmosphere, change of the reflectivity of the surface of the earth, removal of an important "sink" for ozone and the contribution to greenhouse effect through the release of carbon dioxide and other green house gases through burning.

Even though there are areas within Fumesua, Kumasi and other parts of my study areas where trees have been grown either for industrial use or to improve the environment, they are not enough as compared to the alarming rate at which trees are being felled.

2.6 Climate Change

The typical weather conditions in a particular area are simply referred to as its climate. The climate is said to have changed if a permanent change in its weather conditions occurs. Examples of weather conditions are temperature, sun, rain and wind. All the people interviewed by the researcher said that the rainfall pattern had become erratic, the rays of the sun had become scorchy, the temperature of their area had increased and the weather had been windy of late. Is this what Schneider (1989) has been quoted as enunciating that it is because of industrial growth and deforestation that the levels of carbon dioxide, methane and Chlorofluorocarbons (CFCs) have increased in the atmosphere so much that the climate of the earth is changing especially the temperature and Roberts (1989) also concludes that such a change will cause a rise in the level of the sea and disrupt agriculture and shift ecological habitats across the landscape. If Schneider and Roberts attest to these facts then it is now incumbent upon the people in my study areas to curtail runaway technology and deforestation and replace them with benign technology and reforestation in order to safeguard the environment.

In vision 2050 forestry, farm yields especially in Africa are said to be dwindling and the rainfall patterns are also said to have become irregular. Furthermore, a survey conducted by the Environmental Protection Agency (2008:2-7) on the six eco-climatic zones in Ghana from 1961 to 2000 showed that there was an increase in temperature and a decrease in rainfall. The zones were enumerated as follows: Sudan Savanna, Guinea Savanna, Transitional Savanna, Deciduous Forest, Rainforest and Coastal Savanna.

In an interview with D.K. Duah, it was revealed that the temperature of Tikrom had increased in such a way that sometimes breathing was difficult and during sunny days the heat became too high in the area. In another interview, Nana Yaw Tweneboah also enumerated that the climate in his area had changed by giving the following reasons: Abnormal warming, early sunrise, early sunset, early sun reflection, too much heat in the atmosphere, irregular wind blow, longer dry season, lack of humidity and intoxicated air.

2.7 Aquatic Environment

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Water surpasses everything on this biosphere. Living things cannot survive without water. It covers two-thirds of the earth's surface. Water may be salty, blackish or fresh. Some move but others are still. An aquatic environment deals with water but if the water becomes dangerously polluted, humans, animals and plants suffer. Examples are River Subin, River Oda and streams like Bafo and Kofi Ware.

2.7.1 Water Pollution

Manjunath (2007) has observed that water pollution can be grouped as follows: surface water pollution, underground water pollution and marine water pollution. He explained that if domestic sewage and industrial waste water are discharged into surface water bodies like rivers, lakes, streams and ponds, they are said to have been polluted. In an interview with Okwaning Adjei-Sarfo of the Waste Management Department of the Kumasi Metropolitan Assembly, it was confirmed that there is an engineered landfill at Dompouse where almost all the refuse generated in Kumasi is dumped and compacted. He explained that the danger or problem with this landfill is

the black poisonous fluid (leachates) which leaked from the decomposed refuse into surrounding water bodies. The Subin River is heavily polluted because neighbours throw in household waste and solid waste into it. Major rivers within the Kumasi Metropolis has become dumping sites for the neighbourhood and as a result have become polluted.

2.8 Improper Disposal of Waste

Environmental Health Officers within the study areas hold the view that refuse should be hygienically disposed of and that good sanitary standards must be maintained at all times. Improper disposal of waste is a common practice in the study areas. For example, the waste disposal site at Serwaa Akuraa near Ejisu is harmful and poses danger to human health. The sanitary site is very close to residential site just 20 metres away. It has been observed that when it rains the leachates is carried into a stream called Kofi Ware. This stream also flows into Bafo and Bafo flows into Afiasu and Afiasu flows into River Oda. Cholera outbreak and diarrhoea have been reported with the on set of rains. The hospitals and clinics of Ejisu have recorded high rate of diarrhoea and malaria.

2.10 Sand Winning

Sand winning degrades the environment. For construction and development purpose, sand winning has become a common practice within the study areas. It has left in its trail bare surfaces with erosion taking its toll; uncovered trenches that pose danger to human lives and animals; barren lands and deforestation, polluted air with dust that pose danger to human lives. Sand winning at Asaapong has reached alarming proportion and inhabitants are exposed to air- borne dust which is dangerous to their

health. The air quality is compromised and the inhabitants are exposed to health hazards.

2.9.1 SAND WINNING AT ASAAPONG NEAR EJISU-ONWI.

When the researcher went to Asaapong to look at the large area of land that had been degraded by a group of sand winners, Kwame Obeng and Kofi Nti were interviewed. On that land sand winning had been done in such a way that some of the walls of an incomplete house had collapsed and several others had their roads blocked or destroyed completely. The respondent did not understand why the original owners of that large area of land should resell the land to sand winners.

When Obeng was answering questions, he explained that the degradation took place after the land had been sold to some sand winners by the people of the Aduana clan. In his opinion, the destruction of the land would not have taken place if the sand winners had been forced to reclaim the land after their activities. It is close to a stream called Pinkyeme. It used to be a source of drinking water for the inhabitants of the town. Even today, the poor people who can't buy water from the boreholes drink the water from this stream, but sand winners had destroyed all the trees at the bank of the stream and had also created a lot of gullies making the place water-logged.

He ended by saying he was compelled to roof his building and went to live in it against his will because if he had not taken that decision, the sand winners would have scooped all the soil around his house and destroyed it in addition to the ones that were destroyed earlier. Nti (Monday, 16th November, 2009, Asaapong, 4:25p.m) also lamented that the activities of the sand winners had affected him psychologically and

economically because the road to his house had been destroyed, run-off water was gradually washing the sand around his house away and the area had become waterlogged making their movements extremely difficult.

Despite the fact that the Environmental Health Officer thought there were areas in the municipality like Akokoammon, Tikrom, Atia and many others where sand winners were posing problems, the problem at Asaapong was the worst of all.

2.10 Building on Water Courses

According to the Environmental Health Officer, haphazard development is very common in his area. He said it had happened to the people of the Koronko Family of Ejisu. He explained that someone put up a house at a place which was not assigned to him and therefore some people of the area had no access to their houses. He went on to say that the Minister for Environment had to travel to Ejisu about four months ago because some people were building on water ways. He told the researcher about someone who wanted to establish a mortuary on a water way at Kobrim (Ejisu) but had to stop after a series of protest by the people living in that area. He said that after the minister had solved the problem, she was shown places where pit latrines and houses were being built on water ways so she ordered that they should be pulled down. The great question is: Who will implement it?

At Susuanso (Kumasi) some church buildings including Family Chapel International may be pulled down because they are so close to the river in that area.

2.11 Air Quality

The quality of the air can be destroyed through radiation (energy in the form of heat or light that is sent out as waves that can't be seen) and gases (substances which are not solid or liquid, and normally can't be seen. Otto and Towle (1985:775) have noted that: "Atmospheric pollution is an enormous problem. It comes from the smokestacks of industry and the chimneys of homes and apartments. It pours from the exhaust of automobiles, incinerators, and jet planes." We think that what were not mentioned were cigarette smoking, burning of vegetation, coughing and methane which are also among the causes of atmospheric pollution in the study areas.

2.12 Sources of Noise

Even though motor vehicles and traffic, unnecessary blowing of sirens and horns, hawkers and commercial activities, textile mills, sawmills, flourmills, mining activities, entertainment activities, engines, quarrying, musical instruments are all sources of noise, the Assistant Programmes Officer of the E.P.A. attributed most of the noise to religious activities by complaining that so many churches had sprung up and were using loud speakers which was not the case ten years back and attributed it to influx of musical instruments into the study areas. He could not make out why one-man churches used public address systems to speak to a few people. He further said that people used to do their preaching mainly on Sundays but now it is done almost everyday. He also blamed Moslems for the noise they make in the course of worshipping and evangelizing. He ended by affirming that people sited churches in their houses and almost every place, forgetting that noise is a wave; a type of energy that travels in the air which can create health problems, especially, the destruction of

the human immune system and the ear drum. Although, he said they took some to court, they still did it so it did not mean that they had not been doing their work well. According to him, poverty was tackled many years ago but many people were still poor in Ghana as at the time he was being interviewed.

It is surprising that religious people who claim that they are promoting peace are the same people being criticized by many Ghanaians for disturbing the public. By implication they don't put what they teach into practice.

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CHAPTER THREE

SOME THEORIES FOR ENVIRONMENTAL DEGRADATION IN EJISU- JUABEN MUNICIPAL ASSEMBLY AND KUMASI METROPOLITAN ASSEMBLY

3.1 Introduction

We wish to discuss some theories that could account for the environmental degradation in Ejisu-Juaben Municipality and Kumasi Metropolis. There seems to be general consensus that human activities have serious consequences on the environment. Although several theories could be considered as underlying our present environmental degradation; a few theories would be considered, namely:

- The Population Theory
- The Science and Technology Theory
- The Affluent Theory
- The Growth and Development Theory and
- Anthropocentrism

3.2 The Population Theory

There appears to be a negative correlation in the population environment debate. This appears to be so because when human population on earth far outstrips the earth resources, it will result in high depletion of resources, loss of biodiversity, deforestation and environmental degradation. High growth in production will demand increased use of resources in the natural environment to take care of an increased

population. By implication, environmental degradation becomes the price human beings pay for producing more than necessary. High population growth poses a threat to the environment. This is so because it has its tendency of degrading the environment. This again explains the population factor in the current environmental degradation in the Ejisu-Juaben Municipality and Kumasi Metropolis.

3.2.1 The Population Growth Rate of the Ashanti Region

It was affirmed after the 2000 population and housing census that the Ashanti Region had a population growth rate of 3.4 percent. It was said to have increased from 2.9 percent per annum in 1970, dropped to 2.5 percent per annum in 1984 and increased to 3.4 percent in 2000. It was further expatiated that although the region was the most populous, its density (148.1 sq. km.) was lower than those of the Greater Accra (895.5) sq. km.) and the Central (162.2/sq.km) Regions. (The Ghana Statistical Service (2005:9). If the trend remains unchanged the environment will become overloaded because the decomposition rate can't keep up with the rate of population growth in the study areas and end up creating more waste to pollute the environment.

3.2.2 The Population Growth Rate of the Ejisu-Juaben Municipality and Kumasi Metropolis.

Even though the rate of population growth in the two assemblies is high, the one in the Kumasi Metropolis may be referred to as runaway. Its growth rate is now 5.5 percent which is alarming and the growth rate in the Ejisu-Juaben Municipality is 2.5 percent. The total number of people in the municipality is 124,176 and out of the number, 59,286 are males and 64,890 are females. In the year 2000, the total number

of districts in the Ashanti Region was twenty-one (21) and it was the most populous. This has been indicated as follows:

The Kumasi Metropolis is the most populous district in the region. It has a population of 1,170, 270 which accounts for just under a third (32.4%) of the region's population. Kumasi has attracted such a large population partly because it is the regional capital, and also the most commercialized town in the region. Ghana Statistical Service (2005: 25).

In terms of its density it was explained that it had not only the second highest population density in the country (5319), but it was only slightly lower than the Accra Metropolis (5530) while that of the Ejisu-Juaben was 191 (2005 : 26 – 27).

3.3. The Science and Technology Theory

When a population becomes affluent, it employs mechanisms to satisfy its desires – living in mansions, riding in the latest cars and enjoying all the good things of life.

The mechanism for achieving affluence is the employment of science and technology to create new things to satisfy oneself. The miracle of science and technology has been employed to tame nature to produce sophisticated goods and services to meet the demands of humankind. Some people hold the view that they could employ science and technology to solve human problems. Pollution of the atmosphere and water bodies, the depletion of natural resources and the extinction of biodiversity can all be traced to great advancement in science and technology so science and technology should be employed meaningfully in order that the natural environment will continue to support life on earth.

3.3.1 Waste Disposal

The development of technology has led to the creation of more waste products in Kumasi, Ejisu and other areas. Plastic and metal wastes are very common in both the K.M.A and Ejisu. Unused car batteries are dumped in River Subin. Condemned fridges and some electrical equipment are also dumped into the river. Since some of the things we have mentioned are not biodegradable, microorganisms cannot break them down so they end up polluting rivers and land. Lead from unused batteries can also pollute River Subin if measures are not taken to stop the rate at which unused batteries are dumped into the river.

As far as Otto and Towle (1985:771-772) were concerned, if lead from battery manufacture was dumped into rivers, it made bathing in the them or drinking from them or eating the fish in them dangerous since lead is poisonous to most living things. They worked out that those industrial activities like the manufacture of electrical equipment etc could increase the concentration of mercury in aquatic environments and warned that mercury poisoning might lead to blindness, deafness and death.

We agree that the systematic observation and analysis underlying science has provided us with a great deal of understanding about ecosystems and their functioning”. Dianne (2002: 27). In spite of this “... it is apparent that ‘value-free’ science and unbridled technology lead to destruction rather than genuine development.” (Gecaga (2003:31). The destruction of the natural environment in the study areas through dangerous technologies now ushers in another sub – topic known as affluence.

3.4 The Affluent Theory

The affluent theory holds that the environmental degradation in terms of societies whose activities seem to underlie most pollution, extraction of natural resources and the depletion of wildlife and resources. The affluent theory again explains that the most significant factor underlying environmental degradation has to do with the increase in individual affluence and consumption. The desire of humankind to live a comfortable, cosy and bourgeois life underlies the emergence of the new technology which has been charged for being responsible for the environmental crisis.

3.5 The Growth and Development Theory

Today, the population of the earth is growing rapidly, businesses seem to be growing, demand for goods and services appears to be increasing, technology is growing and therefore one may say that environmental degradation is also increasing because if demand for goods and services increases new technologies may also be required and this may put pressure on nature. Developing nations or underdeveloped nations are seriously working in order to be on a par with the developed world. The underdeveloped nations have fallen behind economically and technologically so they also want to move forward technologically in order to keep pace with them. Whether the technologies may create health problems or damage the environment may not be the case because as the saying goes 'the end justifies the means. So far as the automobiles and the aircraft have made life easier for humans, their negative consequences are sometimes taken for granted.

3.6. Anthropocentrism

Anthropocentrism is the belief that humanity is the central fact and final aim of the universe, that everything exists for human benefit and humans have, therefore, the natural right to exercise unrestrained dominion over the natural order. Anthropocentrism proceeds from the view that humans are the supreme rulers of the natural order, hence, they have the right to assign values on the various aspects of nature and to use or destroy them as they wish. If they are useful or can return a profit, they are of value; if not, then they are of no value and not worth preserving.

3.6.1 Religious Affiliation

Another survey conducted by the Ghana Statistical Service (2005:9) showed that:

“The dominant religion in the region,..., is Christianity (77.5%) followed by Islam (13.2%). The proportion of Christians is higher than the national average (68.8%), while that of Moslems is lower than the national average (15.9%)”.

It also indicated that “all other religious groups constitute insignificant proportions of the population. The proportion with no religion is however relatively high (7.3%)”.

3.6.2 The Use of Fuel

Because the Ghana Statistical Service had confirmed that “firewood and charcoal are the main sources of fuel used in the districts for cooking”, it is an affirmation that environmental degradation is going on in the Ashanti Region. They declared that about 72.6% and 18.7% of the inhabitants of the Ejisu-Juaben Municipal Assembly used fire wood and charcoal respectively. In the Kumasi Metropolitan Assembly,

3.9% and 70.9 of the population also used firewood and charcoal respectively. The above analysis presumably tells us that deforestation is becoming a problem in the two assemblies. This was explained as follows:

“The relatively high use of firewood and charcoal as the main fuel for cooking has serious implications for the already depleted forests. Some of the districts that used to have large tracts of their landmass as forest are becoming grasslands.” (2005:11).

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3.6.3 Solid and Liquid Waste Disposal

It was also affirmed by the Ghana Statistical Service that a very

“High proportion of households... solid waste elsewhere, especially in the Kumasi metropolis (10.1%), has very serious financial and health implications. The Metropolitan Assembly uses large sums of money for the cleaning of gutters which could have been used for other development need of the Assembly.”

We may also state that the burning and burying of solid waste in the Ejisu-Juaben Municipal and Kumasi Metropolitan Assemblies may end up causing land, water and air pollution in the long run.

In terms of liquid waste, the Ghana Statistical Service explained that the prominent method of liquid waste disposal in the districts was throwing it on street outside of the dwelling unit and the proportions of households that used this method ranged from 14.2 percent in the Kumasi Metropolis, the only district with a proportion lower than 30.0 percent, to 67.5 percent in Ejisu-Juaben.

They went on to say that throwing liquid waste into gutters was practised to varying degrees, with proportions ranging from 5.9 percent in the Ejura-Sekyedumase to 58.7 percent in the Kumasi Metropolis and finished off by saying that the dumping of solid

into drains, open gutters and even streams and rivers had created a major environmental nightmare for many urbanized districts, particularly Kumasi. The Subin River, which barely forty years ago, was a clean unpolluted stream had become a huge dead, open and polluted drain full of all sorts of waste materials. Many other small streams which were to be part of the beauty of Kumasi could not even be recognized as such so there had been a major ecological disaster.

3.7 Overview of the Theories

From the theories discussed above, the factors at the roots of environmental degradation, it is clear to say that one factor cannot be singled out as the “sole” cause for the environmental degradation are many, complex and each augmenting the other. It appears that human attitudes have been largely driven by anthropocentric mindset that human beings are at the centre of creation and nature has been bestowed on them by divine bequest to serve their needs. Such an idea and the means humankind adopts to fulfill these ideals are basically at the roots of our harmful relations with nature. Perhaps a deviation or a direct u-turn from such perceptions and acknowledging the principle of interdependence of all life-forms and humankind will be necessary for the sustenance of nature.

CHAPTER FOUR

ECO-THEOLOGICAL MODELS AND RESPONSES

4.1 Introduction

Eco-theology is a compound word made of three words, eco-ecology, theo-god, logy-word or teaching or word about. In simple terms, ecotheology is about the word or teaching of God concerning the ecology or/and the environment. On account of this, this chapter brings to light the role of theology in safeguarding against exploitation of the natural surroundings in the K.M.A. and E-J.M.A. Longman Dictionary of contemporary English (2007:1719) defines theology as “the study of religion and religious ideas and beliefs”. Theo comes from the Greek word Θεος which means God and accordingly, Eco-theology may be referred to as using theological ideas or principles to safeguard the natural surroundings.

When Edwards (1998: 126) was expatiating on Eco-theology he explained that the ecological crisis human beings were facing was beyond their comprehension so he suggested religious faith as an antidote to it because he thought faith could provide an ecological ethos and a foundation for an ecological ethics as well. In furtherance of this, he noted that even though some people could use this religious faith to dominate and exploit nature, it was the central task of Christian theology at that time to make manifest the ecological dimensions of the Christian tradition. Surprisingly, most of the Christians interviewed stated categorically that God told humans to exploit nature. Is this the main reason why none of them could tell whether Jesus Christ had ecological knowledge or not?

Even though Edwards thought that love and respect for God must lead to love and respect for creation, the church of England's Board for Social Responsibility was also quoted as enunciating that despoiling the earth was a blasphemy, and not just an error of judgement. Stott himself ended by declaring that destruction of the natural environment "... is a sin against God as well as humankind" (1999:136). This may imply that destroying the environment is tantamount to breaking any of the ten commandments of God which may therefore end up incurring God's wrath. This chapter accordingly discusses carefully the following sub-topics: Stewardship, Nature Spirituality and Eco-justice Models in order to bring to light the interconnectedness or interrelatedness among nature, humanity and God.

4.2 Stewardship Model

According to the Longman Dictionary of Contemporary English (2007:1624), "Someone's stewardship of something is the way that they control or protect it." This therefore makes it vivid that a good steward protects the natural environment while a bad steward destroys it. Draper (2002:23) quoting Learner noted that "stewardship permits people to take leadership roles and act responsibly when a threat to a locally valued place or environment occurs." An epitome of this is what Sarfo Adjei and his workers of the Waste Management Unit of the K.M.A. have been doing in the Subin River, while the Environmental Health Officer of the Ejisu-Juaben Municipality has also been removing refuse dumps with bulldozers and tractors.

Draper was also of the view that local people who felt a sense of stewardship or responsibility might be found cleaning up their natural areas, challenging polluters to do things differently, and demanding action and accountability from their

governments. In the course of this research, it was detected that most of the religious groups or churches and Islamic groups had not taken it upon themselves to sanitize their communities despite the fact that they had been referring to their members as stewards of God. A careful investigation revealed that environmental protection was not part of the thought of stewardship. Most of the interviewees thought stewardship simply meant using their time, talents and possessions (money) to help the church to grow. They were only anthropocentric and theocentric without being biocentric. It was concluded by Draper that stewardship promoted working in partnership with other individuals and environmental nongovernmental groups, as well as with government or private-sector programmes and helped everyone understand the importance of accountability in regard to eco-system sustainability. Simply put, he said stewardship was active earth-keeping that helped promote and attain the public good.

Now if the Greek word *oikonomous* means the manager of someone's estate or house then it denotes that the duties of the steward include management but never for one's own benefit or in such a way as to be contrary to the desires of the owner Young (1994: 172-173). This makes it vivid that religionists have to continuously and actively take care and protect nature in order not to make this world a perilous place to live in and finally incur the wrath of God.

4.2.1 Management

Since stewardship has something to do with or may denote management we have to be very careful in order not to misunderstand it. "Management is normally viewed

anthropocentrically; we manage the earth so that we can continue to reap as much of its resources as possible ” Young (1994:172).

Now we think that the ecological problems on this earth may not be solved if we continue to think stewardship is only about the activity of controlling and organizing nature in order to exploit it later. As far as Young (1994: 173) was concerned, stewardship implied delegated authority because only God has absolute authority and dominion. Dominion and awe belong to God (Job 25:2). Dominion belongs to the Lord and He rules over the nations (Ps 22: 28). Since all dominion belongs to God, human dominion over nature must be regarded as delegated dominion. That is, our authority to care for creation must be thought of as a function, extension, or derivative of God’s dominion. According to him, God delegated responsibility to us, and we are responsible to the delegating authority for how we handle the charge. If we have been entrusted with taking care of nature by God then by implication, it is incumbent upon us to give account of it to Him because he owns it (Psalm 24:1).

4.2.2 Ownership

David states that this earth and all that is in it belong to the Lord (Psalm 24:1-2, R.S.V.). Now if this is the case, then we have to use them sensibly so that we can give a good account of them to the owner in future. Since God has entrusted them to us, we ought to manage and maintain them according to God’s wishes. We should not forget that the land on which we live has been leased to us.

We should be very careful of the way we deal with the natural environment. If Christians in the study areas believe in this assertion, then they have to debunk the

interpretation given to Genesis 1: 28 by some schools of thought that humanity has the right to exploit nature. Antwi, Anti and Ntrel (1990:7) commented on Genesis 1: 28 that the fact that biblical writers had said we were to have dominion over every created thing in God's creation did not mean we should misuse every thing to our own disadvantage. They went further to demystify that these days environmentalists or those who are concerned about the misuse of the environment are warning us of the effects of our exploitation of the resources of the earth so we should be careful not to misuse the natural resources at our disposal, for this will lead to environmental degradation. Now, if misuse of the natural environment can create serious problems for humans then we have to be very circumspect in our dealings with nature.

Young (1994: 88) reasoned that it would be rather difficult to interpret Genesis 1:28 as giving people licence to exploit nature if God's ownership was taken into consideration. He continued affirming that the idea of divine ownership also prevented the opposite extreme, that of worshipping the earth, for ownership presupposed a dichotomy between the owners and owned, between the creator and creation and finally commented that if we understood that the earth belonged to God, it could not possibly become either an object to exploit or an object of worship.

4.3 Nature Spirituality Model

Under normal circumstances, those who try to be spiritual try as much as possible to get closer to their ultimate reality. If this is the case then how will those whose ultimate reality is God behave? This God has entrusted all that he has created to his followers so by implication all followers of God, as well as Jesus Christ, are expected to be good stewards of nature.

Spirituality may simply be the quality of being interested in religious matters, but we think spiritual people are neither anthropocentric nor theocentric. They may not also be theanthropocentric, but those who make sure humanity, nature and God are connected and related in such a way that there is absolute interdependence; no exploitation.

If we believe that environmental destruction is a sin against God and humanity then it becomes an ethical issue. If destruction of the natural environment can end up creating health hazards for humans and lead to deaths then a theology of nature should be developed in order to help people attach much importance to environmental protection. If a theology of nature is developed, many people may be compelled to treat nature as they treat themselves and other humans because they may realize that a sin against God is tantamount to a sin against nature and vice versa. Young (1994) therefore commented that:

“The church stands in need of a fresh reading of the Bible, a reading sensitive to God’s concern and purposes for the environment and humanity’s relationship and responsibility toward it. It is not as easy as said. It requires a new paradigm for understanding life and doing theology, yet there seems to be an ingrained resistance against paradigm shifts in traditional Christianity. The shift must be away from the dominant theanthropocentrism of Western theology to some new framework” (1994:274).

Accordingly, Mante (2004:7) thought that the non – human environment should not be ignored when theologizing because it pervades all African symbolic thoughts and worldviews.

4.4 ECO-JUSTICE MODEL

People have always been crying for justice all over the world. As far as Peter Tosh, a great reggae musician was concerned, equal rights and justices were far better than peace because wherever there was no justice there could not be peace. South Africans fought against the Apartheid System and as at now both Israelis and Palestinians are still fighting for justice. Now if humans on earth whose lives partly depend on nature are crying for justice, then nature also needs to be treated fairly as well in order to return the degraded environments to normalcy. We think what is good for the goose is also good for the gander. Eco-justice may therefore be referred to as fairness in the way nature is treated. We therefore plead with the people in the study areas to have a strong sense of eco-justice.

4.4.1 Christianity, Injustices and the Ecological Triangle

In ancient Israel, many prophets fought against injustices. In Hosea 4:1 – 3, the following has been written:

“Hear the word of the LORD, O people of Israel; for the LORD has a controversy with the inhabitants of the land. There is no faithfulness or kindness, and no knowledge of God in the land; there is swearing lying, killing, stealing, and committing adultery; they break all bounds and murder follows murder. Therefore the land mourns, and all who dwell in it languish, and also the beasts of the field, and the birds of the air; and even the fish of the sea are taken away.”

It has also been stated in Numbers 35: 33 – 34, R.S.V. that murder could defile the land, and except by the death of the murderer there was no way to perform the ritual of purification for the land where a man had been murdered.

Solomon also once commented about justice in the words below:

“Give the king thy justice, O God, and thy righteousness to the royal son! May he judge thy people with righteousness, and thy poor with justice! Let the mountains bear prosperity for the people, and hills, in righteousness! May he defend the cause of poor of the people, give deliverance to the needy, and crush the oppressor! (Psalm 72:1 – 4, R.S.V.)”

That was the wise king asking God to help him so that he would be just in his dealings with his people. If God is just and his people are asking for justice, then nature also needs justice because humanity, nature and God are interrelated and interconnected; if the natural environment is destroyed, humans, plants and other creatures can't exist. If the air is polluted, many living things may find it difficult to breathe in and die consequently; this may create problems for God because there may be no humans worshipping Him on earth.

We must also enunciate that destruction of the ecosystems in the Ejisu-Juaben Municipality may lead to destruction of the cosmic community and integrity of creation because they are interlocked and interdependent. We therefore want to postulate that for the ecological crisis in my study areas to be reversed, Christians ought to make sure they apply anthropocentrism, biocentrism and theocentrism at the same time. This is what we mean when we say ecological triangle. Since justice is simply about fairness in the treatment of people so that life will be interesting, nature also needs justice so that humans, animals, insects, etc lives will go on because if the last tree dies the last man may also die. If man's life depends solely on nature, then nature should be protected so God will be glorified all the time.

4.4.2 Christianity and Sanitation

Being the first environmental scientist in the world, God gave the Israelites some sanitary regulations through Moses and Aaron which stated categorically that people with sores or boils or inflammations which could develop into a dreaded skin disease should be sent to the Aaronite priest for examination and pronouncement. Since God did not want anyone to contract another person's communicable disease, infected persons were made to live outside the camp, away from others, wear torn cloths, leave their hair uncombed, cover the lower parts of their faces and call out 'Unclean, unclean' (Leviticus 13:1-46, R.S.V.). Even mildew in houses were deemed unclean and such houses were eventually pulled down (Leviticus 13:33-53, R.S.V.). Finally, in order to prevent water pollution, the people at military camps were advised to dig holes outside their camps before they could relieve themselves (Deuteronomy 23:12-14, R.S.V.). All those mechanisms were adopted in order to make people protect the environment. A portion of John's third letter to the church leader named Gaius showed that the role of that the role of sanitation in Christianity can't be downplayed. In the second verse, John prayed for the members of the church to the members of the church to be in good health. Anytime sanitation becomes poor, there will be bad health so Christians must attach importance to good sanitation wherever they live so that they will be strong enough to do God's be strong enough to God's work. Now if Christians would abide by these religious injunctions, the ecological crisis may be reversed.

4.4.3 Christianity and the Natural Surroundings

God told Adam and Eve and the Israelites to take good care of trees so that they could eat their fruits and survive (Genesis 2:15; Deuteronomy 20:19). God is so much concerned about nature that humans have been commanded to protect birds in order to be prosperous and also live long (Deuteronomy 22:6-7). Botanists have also declared that birds play a very prominent role as far as pollination is concerned so by implication, without birds, the rate at which plants or flowers are pollinated will go down drastically. Does it mean God does not accentuate extinction of birds? Is this God's own way of preventing extinction of birds and trees? In the parable of the Lost sheep, Jesus taught that God looks after all his creatures with great love and protection. Luke 15:7. Jesus' love for both animals and plants was also declared when he taught his disciples that God feeds animals and takes care of plants. Luke 12: 22 – 28. Is environmental protection one of the rudiments of Christianity?

4.5 African Traditional Religion and Safeguards against Exploitation of Nature

The traditionalists in the study areas believe strongly that there is a supreme being. They say their supreme being is both transcendent and immanent. This simply means that He is far and near at the same time. Sarpong (1974) observed that the fact that God is very near to man and yet so far from man, runs right through the Ghanaian's religious thought and is very well illustrated by an Akan myth: God was once said to be very near to the earth, so near indeed that when the "Old Woman" pounded her fufu, the pestle hit Him. He protested but the "Old Woman" took no notice. God could not go on being hit day in and day out, so He was left with no choice but to retire into the sky. He went on to say that His holiness and hatred of evil were incompatible with

our way of life so he retired into the firmament where He kept a loving but watchful eye on us.

He ended by saying that God did this “through His agents, the lesser deities and the ancestors who are no less His creatures than human beings”.

Traditional Africans are so religious that their history cannot be properly understood without first studying their religions. Grebe and Fon (2006) noted that ethnographic studies had shown that in all cases the religion of African people was at the very heart of their cultures. It controlled much of their social systems, it was the main source of power and regulated matters relating to the land and the weather on which the most Africans depended for their survival.

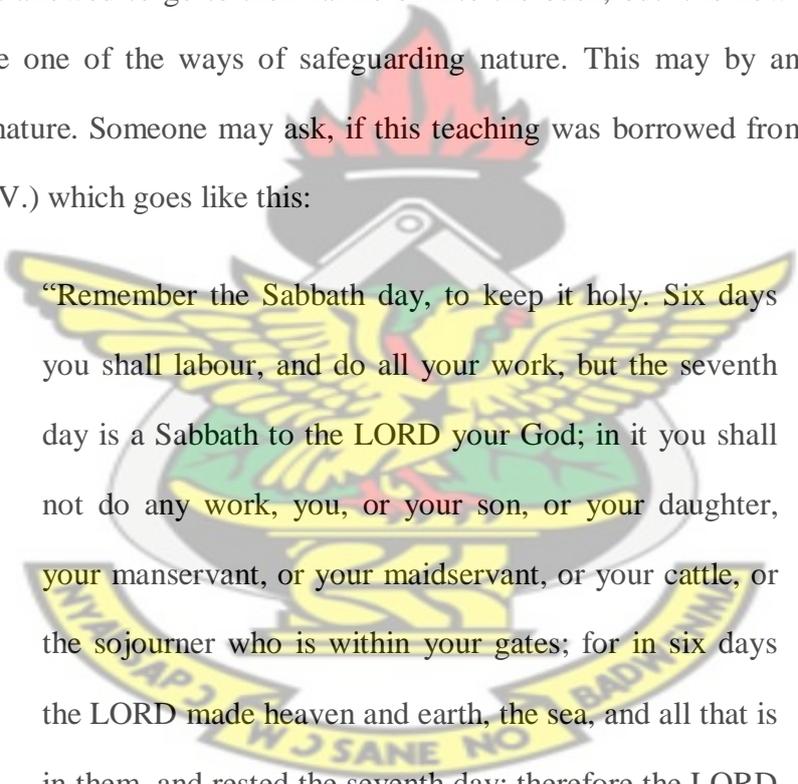
Because Traditional Africans believe that reverence for nature is reverence for God, Busiah (1954) wrote that “an Ashanti craftsman will endeavor to propitiate certain trees before he cuts them down, he will offer an egg, for example, to Odum tree, saying I am about to cut you down and carve you, do not let me suffer any harm.”

Opoku (1978:52) agreed that taboos and restrictions had been used to preserve the environment from time immemorial and accordingly stated that the characteristics of the traditional culture was reverence for nature and oneness with it so to enforce that reverence, there were many prohibitions, all aimed at preserving nature, because nature was not just an object, but a tangible reality from which humanity derived their sense of wholeness and well - being.

Asante (2001:25) also considered the place of the land in African and Biblical spirituality. He explained that “the human’s claim to the land, the cultivation and

harvesting of the land and its produce was subject to God's direction and to His absolute ownership of the land". He further noted that "the traditional African conception of the earth is that it is sacred, not because it is a god but because it owes its being, its animation, its sacred quality to God, the Creator- Animator who creates and animates nature."

Opoku (1978:53) explained further that: "People are forbidden to till the earth on certain days of the week, and this is to show respect for Mother Earth". In the Ejisu-Juaben Municipal Assembly, every chief used to set aside a day on which his subjects were not allowed to go to their farms or into the bush, but it is now dying out. That might be one of the ways of safeguarding nature. This may by and large help to protect nature. Someone may ask, if this teaching was borrowed from Exodus 20: 8-11 (R.S.V.) which goes like this:



"Remember the Sabbath day, to keep it holy. Six days you shall labour, and do all your work, but the seventh day is a Sabbath to the LORD your God; in it you shall not do any work, you, or your son, or your daughter, your manservant, or your maidservant, or your cattle, or the sojourner who is within your gates; for in six days the LORD made heaven and earth, the sea, and all that is in them, and rested the seventh day; therefore the LORD blessed the Sabbath day and hallowed it."

Now whether it was borrowed from the Bible or not does not matter here. What matters is the protection the day of rest gives to the earth because it's the earth that gives humanity everything for survival.

Opoku (1978:53) ended by saying that in the farming areas too, it was taboo for anyone to bring home a whole bunch of palm fruits from the farm. One was expected by custom to cut a bit of the palm fruits and leave them in the farm before returning home because it was an expression of gratitude to Mother Earth for the harvest made. He explained that underneath the taboo was the idea that every palm fruit which was brought home was going to be boiled or cooked and the kernels would not germinate but the palm fruits left on the farm or forest would germinate and grow into palm trees and provided food, not only for the present generation, but also for future generations.

Since the traditionalists in my study areas still believe that their methods of conserving the natural environment were effective and are still useful, they are still advising us to go back for them. The answer given by some traditionalists showed that they still revered nature as well as God. Out of the twenty traditionalists interviewed, all of them drew our attention to taboos, rituals, gods of the sea, rivers, lakes, forests and animals. They talked about the importance of getting days of rest for nature and concluded that offenders should be made to pacify the gods anytime they went contrary to the rules.

4.6 Islam and Environmental Safekeeping

Moslems believe in Allah, the angels of Allah, judgment day and Mohammed as His messenger and many others. The fact that Allah is the greatest and therefore no one deserves worship apart from Him, many Islamized people all over the world do whatever Allah tells them to do with great alacrity without murmuring. Therefore the researcher thinks Moslems may play an important role in the preservation of the environment should they apply all the ecological principles outlined by Allah through the prophet.

Alhilaly (1993) noted that:

“The preservation of water for the drinking of mankind, animal life, bird life, and vegetation is a form of worship which gains the pleasure of Allah the Exalted. Islam also forbade urinating in pools of still water or otherwise contaminating water bodies.”

He further noted from the above that an inference could be drawn that Islam also forbade sewerage and factory outpours to go to water ways or to the ocean as this would pollute the water and threaten marine life.

Alhilaly again indicated that the prophet Mohammed had ecological wisdom and supported his claim with the quotation below:

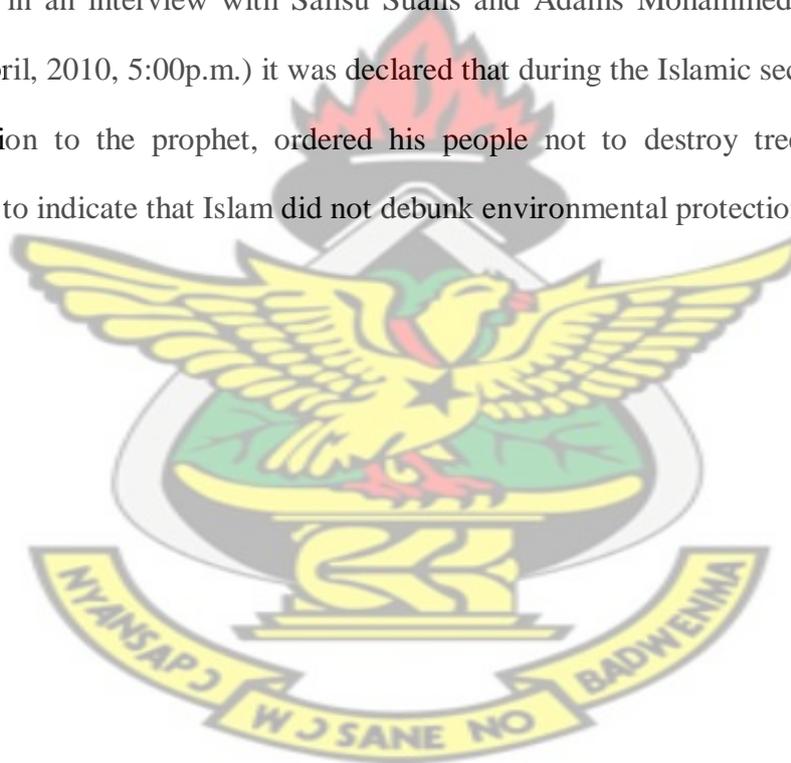
“One who revives dead land, the land becomes his (that is if someone plants on barren land which was not owned by anybody, and is not being used, he will have legal title to this land) and whatever eats from it causes a reward form God for the cultivator of the land.”

Alhilaly explained that the prophet may have said this because the earth might be considered their first mother: they lived on it and got food from it so it had certain rights over them. Now if many Moslems will abide by this religious injunction, they may save themselves and many others on this planet but surprisingly the reality of this is that many Moslems communities in the study areas are treeless and polluted. Does it mean their leaders have neglected the ecological principles outlined by the prophet? Even another tradition makes it more inviting in the following words: ‘Whoever,

revives a piece of land not belonging to anybody, becomes most worthy to own it.’
The question is when are they coming out to officially declare their willingness to fight against environmental unfriendliness and claim their blessing from Allah?

Even though almost all the Moslems we interviewed told us Mohammed had ecological wisdom we were astonished we did not see a lot of trees in most of the Zongo communities we visited. Nonetheless Sheikh M.A. Nagir, Ghana Institute of Languages, Kumasi, spoke emphatically that the Qur’an supports environmental friendliness and debunks environmental destruction.

Finally, in an interview with Salisu Sualis and Adams Mohammed of Ejisu Zongo (29th April, 2010, 5:00p.m.) it was declared that during the Islamic second war, Bilal – companion to the prophet, ordered his people not to destroy trees, children and females to indicate that Islam did not debunk environmental protection.



CHAPTER FIVE

PRESENTATION, ANALYSIS AND INTERPRETATION OF FIELD DATA

5.1 INTRODUCTION

This indispensable chapter by and large presents a detailed and clear sighted analysis and interpretation of the extensive data collected from the field of study. Those data made it possible for us to generalize and extrapolate about the state of affairs.

5.2 PRESENTATION OF RESPONSES

The various research methodologies adopted to collect data from the areas of study in order to answer the research problem and its sub-problems included face-to-face interviews, observations, documents (newspaper articles), past records and questionnaires. Throughout the survey, the researcher saw to it that biases did not creep into the research project; no influence or condition was allowed to distort the data.

Even though the basic rule states that 'the larger the sample, the better', the researcher deemed it wise to choose a sample size of 400, relying so much on Gay's (1996:125) suggested guidelines. Both probability sampling and non-probability sampling were used. Under probability sampling, simple random sampling was chosen and under non-probability sampling, convenience and purposive samplings were adopted. It should be enunciated here that out of the 400 people who received the questionnaires, only 300 of them returned theirs. Although respondents gave different answers to some of the questions, similar answers were also given to some questions. The

researcher posed series of questions, summarized their responses with percentages, frequency counts and then made inferences and derivations from the responses of the sample.

Finally, phenomenological study, triangulation, closed and open-ended questions played vital roles in the course of the survey.

5.2.1 KUMASI METROPOLITAN ASSEMBLY, EJISU-JUABEN MUNICIPAL ASSEMBLY AND ENVIRONMENTAL DETERIORATION

Out of the 300 questionnaires that were received by the researcher, 80% of them stated with pinpoint accuracy that environmental deterioration was human-induced. 10% also attributed it to spiritualism and the rest attributed it to sin. Humans can't live without an environment so they thought taking care of their environment should always be the greatest preoccupation of the inhabitants. They thought that the rate at which the people of the study areas were messing up their natural surroundings was so bad that the right measures should be put in place otherwise both nature and the inhabitants might be eliminated gradually. All the people who returned their questionnaires declared emphatically that their environments were fizzling out when they were asked to respond to the question, "Are there some environmental problems in the K.M.A. and E-J.M.A.?" Some of the respondents were inhabitants of Ejisu, Kwadaso, Adum, Kejetia, Tikrom, Asaapong, Kwamo and many others. They really proved beyond reasonable doubts that "to be is to be in an environment". Mante (2004: 157).

5.2.2 THE CAUSES OF ENVIRONMENTAL DEGRADATION IN THE STUDY AREAS

It is now common knowledge in Africa that the natural surroundings are being degraded at a very fast rate by humans. Mante (2004:22) therefore affirmed that in Africa disruption of the self-regulating mechanisms of natural systems on which humans depended was too vast and concluded that more often than not, the Africans did it themselves unknowingly. Even though the ravagers of the environment in the study areas were mostly humans, they kept blaming one another and paying lip-service to the problems. In spite of this, the respondents in the study areas finally figured out that their environmental problems were being caused by: Christians' understanding of stewardship, Exploitation of nature by Christians, Refusal to Condemn Environmental Destroyers Outright, Poor Management of Nature, Human Population Growth, Spiritism, Poor Interpretation of the Gospels, Noise, Frequent Shortages and High Prices of Liquified Petroleum Gas, Bad Gases, Refusal of Sand and Stone Winners to Reclaim the Land, Inability to Implement the Environmental Rules Prescribed by the Prophet, Agrochemicals, Modernity, Concessionaires, Chain Sawing, Leachates, Christians' Understanding of the Ecological Triangle, Technological Advancement, Relegation of farmers to the Background, Improper Waste Disposal, and the Use of Pestles, Mortars and Canes.

5.2.2.1 CHRISTIANS' UNDERSTANDING OF STEWARDSHIP

In response to how 150 Christians in my study areas understood stewardship, all of them said it meant using one's talents and time very well and taking good care of one's possessions without specifically mentioning active earth-keeping. Almost all their attention was on using some of their possessions (money) to do God's work

simply because God is the owner of everything and therefore He could decide to either make them rich or poor. They could not link environmental friendliness with stewardship.

5.2.2.2 EXPLOITATION OF NATURE BY CHRISTIANS

In another survey to find out whether nature should be exploited by Christians in my study areas, hundred out of the one-hundred and fifty Christians answered in the affirmative and reiterated that God had given them that authority so by doing so they were doing what they had been commanded to do by God. In order to perform another religious duty, they said they had been given the right to eat any animal or bird that they would come across. They quoted Genesis 3:16-19 and 1Timothy chapter 4 to buttress their point. Among the people who answered in the negative were Seventh day Adventists, Catholics, and Presbyterians. One of the respondents, a Seventh-Adventist Church pastor said that God would punish every polluter or destroyer of the environment. He reiterated that if people drank polluted water and died or felt ill, God would not set free, the polluters. On the contrary, the associate pastor of Kumasi Church still believed that Christians had been given power to exploit nature.

5.2.2.3 REFUSAL TO CONDEMN ENVIRONMENTAL DESTROYERS OUTRIGHT

In terms of whether environmental protection should be made one of the rudiments of Christianity, all of them responded in the affirmative; they had begun to believe that it was a sin against God but as to whether its negative consequences were tantamount to

murder had been the bone of contention among the Christians. Out of 150 Christians surveyed 45% agreed intoto, 25% agreed partially and the rest did not agree at all. Owusu Wilson of Baworo was among those who agreed partially because he could not decipher whether those who had been using environmentally unfriendly products like insecticides to destroy the ozone layer and also kill mosquitoes to set humans free would also be considered murderers in the presence of God!

5.2.2.4 POOR MANAGEMENT OF NATURE

Again, out of the three-hundred respondents who were made to ascertain whether greed of the rich and poverty of the poor were the main reasons why the environment was being destroyed, sixty percent (60%) of them replied in the negative, twenty percent (20%) replied in the affirmative and the other twenty percent (20%) replied with reservation. Most of them confidently said, “No, rather poor management of the environment.” Most of them thought the environmentalists had been paying lip-service to environmental issues. They also affirmed that the existing laws governing the natural surroundings were too flexible. For example chainsawyers and hunters can now fell and shoot respectively without being brought to justice. Improper dumping of refuse was common and defecation behind houses, in bushes, on refuse dumps was the order of the day. Some foresters themselves were backing secretly those who had been felling trees in the course of the survey because of money.

5.2.2.5 HUMAN POPULATION GROWTH

When the Christians were surveyed again to find out the meaning of the first part of Genesis 1:28 (R.S.V.) which goes like this: And God blessed them, and God said to

them, 'Be fruitful and multiply, and fill the earth and subdue it', an astounding ninety percent (90%) commented that they had been mandated by God to populate the earth so by implication, birth control should not be prioritized by Christians. The rest of them also agreed that even though they had been told to do so, God did not mean every couple should give birth to four or more children, but rather two or three children per couple could still populate the earth, as well as the study areas.

5.2.2.6 SPIRITISM

In response to: "What are the causes of diseases and deaths", eighty percent (80%) of them attributed them to witchcraft, ten percent (10%) attributed them to God and the rest attributed them to environmental degradation. Those who attributed them to God were mostly Muslims and some few Christians. The people were so much afraid of wizards and witches that the negative effects of environmental deterioration had been somewhat relegated to the background.

5.2.2.7 POOR INTERPRETATION OF THE GOSPELS

When the Christians were asked to respond to the question, "Can you quote one verse in the New Testament indicating Jesus Christ once taught his disciples the importance of environmental protection?", all of them circled 'no'. This denoted that many Christians in my study areas could not decipher whether Jesus Christ of Nazareth had ecological knowledge or not.

5.2.2.8 NOISE

In terms of whether noise could create health problems an astounding 90% of the 150 Christians interviewed did not know noise could create health problems. Most of the above Christians were those who used drums and other piercing musical instruments. All the six environmentalists knew its negative consequences. All the thirty four teachers also agreed without reservation that it had bad effects and fifteen out of the twenty students also confirmed what the environmentalists and teachers affirmed.

5.2.2.9 FREQUENT SHORTAGES AND HIGH PRICES OF LIQUIFIED PETROLEUM GAS

When all the 300 respondents were asked the question, “Which of the following fuels do you prefer?”, all of them circled ‘gas’ but 60% of them lamented that they had reverted to the use of firewood and charcoal on account of frequent shortages and high prices. It is an indisputable fact that the government of Ghana introduced gas with the aim of discouraging charcoal makers, sellers and users and by so doing safeguarding the environment, most of the inhabitants in the study areas are sometimes compelled to use charcoal and firewood against their will.

5.2.2.10 BAD GASES

Responding to the question, “Enumerate the changes you have observed in the climate of your area?” All the 300 respondents noted that the rainfall pattern had changed completely and the weather had also become warmer as at the time they were responding. They commented that there wasn’t much rainfall in December heretofore but that was what they were experiencing. Despite the fact that all the respondents

blamed humans for continuously releasing bad gases into the atmosphere and as a result depleting the Ozone Layer, the Christians were not perturbed because they thought that it was a sign of Jesus' second-coming which had been their desire since time immemorial. They also complained of early sunrise, early sunset, irregular windblown, polluted air etc.

5.2.2.11 REFUSAL OF SAND AND STONES WINNERS TO RECLAIM THE LAND

Responding to the command, "Sand and stones winning should be banned outright", none of the 300 respondents agreed completely but rather they suggested that sand and stones winners be made to reclaim the land after their activities.

5.2.2.12 INABILITY TO IMPLEMENT THE ENVIRONMENTAL RULES PRESCRIBED BY THE PROPHET

In response to: "Do you agree that environmental reduction (degradation) is a sin against Allah?", all the 50 Moslems put a tick against 'yes'. In another response to: "Do you agree that Mohammed had ecological wisdom?" all of them emphatically answered in the affirmative once again.

When responding to the question: "what will happen to Moslems who exploit nature as a result of greed?" all of them surprisingly said they would go to hell if their sins outweighed their good deeds.

In response also to, "Can we make environmental protection one of the rudiments of Islam?" they said it was already in operation. When responding to: "Should the

leadership of Islam excommunicate those who exploit nature to the extent that it causes health problems for Ghanaians?” 30% agreed, 10% did not agree and 60% said the sharia should rather be used. By implication, Muslims completely supported environmental protection but their problem was how to convince their followers to put their environmental knowledge into practice in the Zongos.

5.2.2.13 AGROCHEMICALS

In response to: “How farmers dispose of waste on their farms”, the three agricultural extension officers who were surveyed in the study areas stated that some farmers had been leaving waste materials on their farms instead of burying them to prevent surface water contamination. Even though burying of the waste materials may cause land and underground water pollution, their attention was not on that.

5.2.2.14 MODERNITY

All the fifty traditionalists still showed that they believed in the traditional methods of environmental protection when they were responding to the question: “Are the traditional methods of protecting the environment still effective?” They lambasted people who had been hiding behind science and technology to destroy the reserves or legacy left behind by their predecessors. They also challenged those who condemned traditionalists for using taboos and totems to preserve nature.

5.2.2.15 CONCESSIONAIRES

In response to: “Do concessionaires destroy the environment?” 90% of the 300 people said the fact that their work was to cut down trees, they had been destroying the

natural surroundings. Their critics, such as farmers said they sometimes cut undersize trees and also destroyed their farms in the course of their activities. Even though Dapaa Siakwan who is the Deputy Manager and Timber Inspector of the Forestry Services Division explained on 13th November, 2009 at 9:20am that before they granted concessions to people they went to the chiefs for them to give their consent so by implication, it was incumbent upon the chiefs to make sure concessionaires did not destroy the environment. He further suggested that if the chiefs could liaise with religious people and other citizens of their towns and villages concessionaires would do their work well.

In conclusion, he said the situation worsened if the contracts were approved in Accra because those contractors always relegated the interest of the inhabitants of those areas to the background.

5.2.2.16 CHAIN SAWING

An astounding 100% of those who returned their questionnaires lamented that chain sawers had been destroying the trees and polluting the air when they were responding to the statement: “Chain sawers have done more harm than good”. Dapaa Siakwan agreed with the respondents when he commented that they used to give permit to chain sawers to enable them do their work well but they had to cancel it somewhere along the line when they realized that the chain sawers were exceeding their quotas and felling trees indiscriminately. He therefore appealed to the highest body of the church and the top officials in the study areas to warn them not to destroy the vegetation so that posterity could also benefit from it.

Dapaa concluded that there were no more trees in the reserves since loggers (regulated) and chainsaw operators had cut all of them. In his opinion, it would take about 100 years for the study areas to get replacement since trees take about 100 years to get to maturity.

5.2.2.17 LEACHATES

Some of the respondents especially the environmentalists lamented about the negative effects of leachates. Surprisingly only 10% of the respondents knew its long-term bad effects. Okwaning Adjei Saforo of the Waste Management Department (K.M.A.) stated categorically that the black liquid which oozes out of decomposing refuse should always be taken care of because if it got into contact with sources of drinking water people and animals might die. His reason for that extrapolation was that leachates is poisonous or toxic to both humans and animals so it was incumbent upon humans to manage it very well.

5.2.2.18 CHRISTIANS' UNDERSTANDING OF THE ECOLOGICAL TRIANGLE

Even though most of the respondents proved that they believed in trinity, only a few of them were able to connect anthropocentrism, biocentrism and theocentrism effectively. Only 40% believed that man, nature and God were interrelated and interconnected. Most of the Christians affirmed the relationship between man and God and debunked the importance of nature in salvation.

5.2.2.19 TECHNOLOGICAL ADVANCEMENT

In response to: “Should modern technology continue?” an astounding 95% circled ‘yes’ without ascertaining whether those technologies might be benign or destructive. Phenomenological study showed the people in the study areas loved novelty and ostentation, but no new thing can be created without disturbing nature. We must bear in mind that omelette can’t be made without breaking eggs and anytime we break the eggs we aggravate the plight of the natural environment.

5.2.2.20 RELEGATION OF FARMERS TO THE BACKGROUND

In spite of the fact that farmers are those who take care of trees, they are not consulted before the trees are harvested by concessionaires. In response to: “Do the chiefs inform farmers before concessions are granted?” all the farmers circled ‘no’. To add insults to injuries, observations also showed that the concessionaires sometimes destroyed the crops of the farmers and sometimes refused to compensate them.

5.2.2.21 IMPROPER WASTE DISPOSAL

Throughout the survey, all the respondents kept blaming the K.M.A. and E-J.M.A. for not putting measures in place in order to get rid of refuse that had been piled up in the sanitary areas and in water ways as well as rivers. While Opoku-Mensah was attributing it to their broken-down trucks, Saforo was also condemning those who had been throwing their unwanted materials into water bodies, gutters and by the roadside.

5.2.2.22 THE USE OF PESTLES, MORTARS AND CANES

All the respondents admitted that they had also been indirectly motivating people to continue cutting trees because respondents had been buying their products. Some of them especially teachers pleaded with technologists to invent rubber sticks for them to use in their teaching activities. As to whether respondents would stop pounding fufu became very difficult. Comfort Serebour also stated that although the use of pestles and mortars helped to degrade the forests it took a long time before they get spoiled. This connotes that anything made from wood that lasts for a long time may not cause any serious destruction.

5.3 DATA ANALYSIS

This is where a detailed analysis of the data collected from the field comes into operation, a careful examination of the data takes place here for people to understand them better.

5.3.1 RESPONDENTS AND THEIR ASSESSMENT OF THEIR NATURAL SURROUNDINGS

An astounding 100% of the people who partook in the research through answering of questionnaires said with pinpoint accuracy that nature was fizzling out in the study areas. Some of the respondents who spoke bitterly about the dwindling natural surroundings were Okwaning Adjei-Saforo, Opoku Mensah, Hamidu Abdulai, Kwame Obeng, Kofi Nti, Robert Bamezor, Young Acolatse Barnabas, Yaw Tweneboah, D.K. Duah, Abbott Ansong. Even though the causes given by the respondents were many, those with high frequencies were: Chain sawing, Sand

winning, Concessionaires, Residential Accommodation, Population Growth, Noise, Failure of the Religious People to make Environmental Protection Rudimentary, improper Waste Disposal, Poor Management of Nature, Technological Advancement and Relegation of farmers to the background. The most mentioned cause was poor management so we think the environmental problems may be curbed if everyone becomes a stakeholder especially religious people, farmers and agricultural extension officers.

5.3.2 RELIGIONISTS AND THEIR NATURAL SURROUNDINGS

Responses that we had from respondents proved positively that the three main religions (Christianity, Islam and African Traditional Religion) were not the cause of the stalemate or deadlock in the environmental debate between religion and environment, but rather the religious people themselves did not accentuate the environmental ideas that they obtained from their holy books into. It was realized that even though the African Traditional Religion does not have a holy book, its followers were able to protect and preserve nature until modernity eventually neutralized those ideas. They considered nature as their holy book. Therefore, it is now incumbent upon religionists to lead the campaign against environmental reduction because it is their religious duty.

5.3.3 FINDING SOLUTIONS TO THE ENVIRONMENTAL PROBLEMS

Many environmental problems were identified in the course of the survey. Looking into each of them one after the other, we realized some of them could be pinpointed and extirpated but the rest could be a hard nut to crack. For example the problem

about Christians' understanding of stewardship could be solved if their leaders meet, redefine and institutionalize it and poor interpretation of the gospels can also be solved by giving the right interpretation through the stakeholders of the orthodox churches, but problems like noise, relegation of farmers to the background, improper waste disposal, residential accommodation and roads construction, chain sawing, leachates, agrochemicals, concessionaires etc boil down to poor management of nature. We therefore advise that every inhabitant be made a stakeholder in order to get rid of the cankers. Some are very difficult to solve because they are necessary evils. Examples are agrochemicals, residential accommodation, chain sawing, construction of interchanges etc.

5.3.4 ENVIRONMENTAL DETERIORATION AND SURVIVAL OF THE PEOPLE

It became conspicuous after the research that the use of aerosols could deplete the ozone layer, automobile emissions could also cause an irreversible damage to the environment and also cause respiratory tract diseases in humans and animals. It was also detected that the use of some chemicals like lead, D.D.T. and Gamalin 20 could also cause land and water pollution and might enter the food chain. Again, chain sawers, sand and stones winners and concessionaires exploited nature and ended up making ends meet. Their activities destroyed the biodiversity, created desertification, erosion, drought and famine. What we deduced was that even though those activities which were human-induced took place because of survival, they ended up worsening the plight of the people who depended on water and forest products in order to make ends meet.

5.3.5 WHY THE CURTAILMENT OF THE ECOLOGICAL PROBLEMS IN THE STUDY AREAS IS NECESSARY

Now, to be able to limit or reduce the ecological problems facing the study areas, ecological naivety must first be extirpated so that the people may understand why they should eat green, grow green and plan green throughout their lives. Ecosolutions are vital because they may prevent further depletion of the ozone layer, destruction of biodiversity, reduce global warming, pollution of the water bodies, the air, the land and above all conscientise the people about the importance of trees and plants in both the reserves and off the reserves. The ecological disaster may be curtailed if everyone considers themselves as stakeholders. Humans must work harder to safeguard their environments in order to boost their immune systems, live longer and prevent skin cancers.

5.3.6 RELIGION, CAN IT BE THE FINAL ARBITER?

Environmental destruction has been going on since time immemorial in the study areas, but while environmentalists and ecowarriors are working very hard of their own volition to curtail it, there are those who are of the view that it can't be stopped. They may be right because more often than not they see their politicians and other concerned people speaking about the dwindling environment, but they see no changes. We think that the antidote may be found in religion. Many religious people in the study areas especially Christians and Moslems will not mind losing their lives if and only if what they have been asked to do is a religious injunction, so if the religious leaders can now pinpoint to their followers that environmental degradation is a sin against man, nature and God and can therefore distort the communication between them and their ultimate realities, they may go all out to make sure they

protect the environment in order to obey their ultimate realities. It must also be stated that the fact that only 7.3% of the inhabitants of the Ashanti Region is without religion, Ghana Statistical Service (2005:9), is a clear indication of the fact that the inhabitants of my study areas are very religious and can therefore quash the environmental problems to a great extent.

5.4 INTERPRETATION OF THE RESPONSES

Firstly, many of the Christian respondents seemed not to have understood the term stewardship well. Most of them referred to stewardship as taking good care of their possessions, time, talents etc but what their explanation lacked was active earth-keeping. Amazingly, none of the respondents knew that God's stewards were also supposed to protect the natural surroundings. They did not see it as a religious duty.

Secondly, in the course of the survey, it was discovered that chain sawers were at first given permits to harvest trees but according to Siakwan, Timber Inspector, they stopped when it became conspicuous that the chain sawers exceeded their quota by cutting down trees indiscriminately. The Deputy Manager of the Forestry Services Division continued saying that if his department had not stopped the chain sawers, their activities would have had more negative impacts on the study areas. He advised that the highest body of the church be made to go in and speak to those who were destroying the vegetation. He ended up blaming some of the top officials in Ghana for condoning and conniving. The above reasons may be the reasons why he said there were no more trees in the reserves.

Thirdly, it was revealed that some concessionaires were having field days and therefore doing whatever they liked in the study areas because some of their contracts were approved from Accra. He further explained that anytime one's contract was approved from Accra, there was the likelihood that the one would neglect the interest of the inhabitants of the area and fell more trees than required. This respondent also reiterated that concessionaires always got too much freedom to do their work and destroy the vegetation because the chiefs sometimes failed to draw the attention of religious people and other citizens of the study areas about their activities. This implies that the concessionaires sometimes finished harvesting their trees before the inhabitants might be aware.

The fourth response that also needs explanation is sand winning. This was common because it took place in most of the towns and villages in the study areas. During the survey sand winning was seriously going on in towns like Kwamo, Tikrom, Atia, Akok]amm]n etc, but the most serious and dangerous sand winning was taking place at Asaapong, near Onwe-Abenase. Respondents like Kwame Obeng and Kofi Nti complained a lot about the negative effects of the activities of sand winners. As far as Obeng was concerned, the people of the Aduana Clan sold their land to sand winners, but they refused to state in the agreement that the land should finally be reclaimed. He added that even the stream called Pinky[me had been destroyed in the course of their activities. Expatiating upon it, he said even if he had not gone quickly to roof his building and lived in it, sand winners would have destroyed the land as well as the building. Kofi also complained palpably and painstakingly that as a result of sand winning, he could no more convey feed to his poultry and livestock farms by car or lorry. He continued to say that sand winners had dug all the sand around his plot

making his place look like an island. Since the area had become waterlogged, mosquitoes were using the area as a breeding place during the visit. Pictures that the researcher took showed a building that had collapsed and trees that had been destroyed as a result of sand winning.

The fifth response that also needs interpretation is how Christians understand the ecological triangle. The fact that most of the respondents did not know that man, nature and God are interrelated and interconnected should be a wake-up call to all the inhabitants especially, environmentalists and religious people. It was amazing that many of the Christians who were supposed to lead the campaign against environmental destruction did not know that nature and God had to work together so that humans would have peace. The Christians only accentuated the relationship between humans and God and failed to attach importance to nature.

The sixth response to whether leachates could have negative effects on nature was not encouraging at all since only a few of the respondents knew the negative effects of it. It is the black liquid that comes out of decomposing refuse. Apart from its ability to contaminate water bodies as in the case at Ejisu, it also pollutes the air in its area and makes life unbearable for the inhabitants of the area. It is therefore advisable for health inspectors to make sure refuse is not dumped near any source of drinking water. Environmentalists and Christians must also make it a point to plant flowers that have nice perfume scent and can absorb some gases in such areas.

In the seventh response, almost all the respondents seemed to have developed a liking for technology but they also seemed to have forgotten that the more they advanced technologically the more they destroyed the natural surroundings. For example before

the interchange at Sofoline was constructed, there were trees, plants and some animals, but after the construction, they were not seen again. Another example is the use of automobiles. Automobiles use fuel before they can be in motion so the carbon monoxide that is always emitted ends up polluting the air and causing respiratory tract infections. Although technology seemed to have made life more enjoyable for the inhabitants in the study areas, the same technology seemed to have created a lot of environmental problems for them.

The survey also showed that farmers who always took care of the trees were not contacted before concessions were given. On account of this, they also seemed to have neglected their God given duty. They said they took that decision because they seemed to have been declared persona non grata. They therefore stopped protecting the trees which was not the case heretofore and that indifference may have been one of the reasons why the trees in both the reserves and off reserves have fizzled out.

It was also pinpointed by all the respondents that improper disposal of waste had been a thorn in the flesh of the inhabitants of the study areas. Environmentalists and many other people were worried in the course of the survey because of the waste heaped all over the study areas. At Anloga in Kumasi, carpenters had poured a lot of sawdust in the Subin River. Other unknown people also dumped fridges which had outlived their useful lives in that same river. In fact all kinds of waste had been piled in the river especially empty bottles and batteries whose useful lives had ended. What we were afraid of was the presence of mercury in fridges which can cause cancer and the presence of lead in batteries which can also destroy tissues in the body. It was also revealed that many landlords and landladies were opening their septic tanks to direct

the effluent into gutters during rainy days. We deduced that that lifestyle could finally lead to outbreak of diseases.

Another interesting revelation that came out was that constant use of canes at schools and homes, pestles and mortars could also cause desertification. From time immemorial, people had been using them without realizing their effects on the environment. Some of the respondents like Comfort Serebour of Ejisu thought that although it was true that their usage could destroy nature, it would be to some extent because pestles and mortars last for a long time. Some of the teachers eventually suggested that rubber sticks be used in place of canes.

The next response which was also shocking was some of the Christians' demonstration that they had been given power over nature so they were at liberty to exploit it. Even protection of animals and trees etc was not seen as part of their religious duties. They even went ahead to affirm that they could decide to eat whatever they would come across. This response made us deduce that Christians might be among the ravagers of the natural surroundings. At the end of the survey, it was also deduced that only a few respondents had attributed the environmental problems to greed of the rich and poverty of the poor. Most of them attributed it to poor management. We think it is because of lack of management skills that we are faced with ecological crisis. To be able to solve the problem to a great extent, either management consultants are hired or management training courses are introduced in order to help the environmentalists to up and do their work.

Christians' claim that they have been mandated to give birth to more people to fill the earth was confirmed once again by the responses given in the course of the survey.

Many of them thought the command in Genesis 1:28 asking them to be fruitful and multiply meant there should not be birth control. They must bear in mind that the author of Genesis did not specify how many children should be born by every couple. By implication, if each couple gives birth to two children, multiplication has still occurred. Respondents must not forget that the more people there are, the more babies are likely to be born and if that happens, human population density will increase. This might lead to overloading of the environment and create more waste to pollute the natural surroundings.

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Another amazing revelation exhibited by respondents was their belief in spiritism. Most of them attributed the cause of diseases and deaths to witchcraft. In this case, it will be very difficult for the respondents to take good care of themselves and the environment. Almost anyone who died was said to have either been killed by Antoa Nsuo Nyamaa or witchcraft so instead of clinging to active earth-keeping to make sure the environmental problems would be curbed, they seemed to have feared evil spirits more than environmental problems. The adage which goes like this: 'Cleanliness is next to Godliness' seemed not to have prevailed in the study areas.

Furthermore, the Christians demonstrated clearly that their knowledge in the gospels (Matthew, Mark, Luke and John) was limited when they were made to tell whether their Saviour, Jesus Christ had ecological knowledge or not. If they had known, their attitude towards the environment would have been cordial. The Christian respondents revered Jesus Christ so much that if they had known in the course of the survey that their Saviour held nature in high honour, the level of environmental degradation

wouldn't have been like that. It is high time Christians in the study areas learnt to interpret the gospels well.

The next thing that perturbed the inhabitants so much was noise, but surprisingly majority of the Christians did not know noise could create health problems. Those who knew its negative effects were the environmentalists, teachers and some of the students. Noise is a wave; a type of energy that travels in the air, but if it goes beyond 90 decibels, it creates problems. Throughout the survey, we heard piercing noise in Kumasi from public address systems. When the assistant programmes officer of the E.P.A. was contacted he said that they had been prosecuting noisemakers, but they had not been able to curb it. He said those who had been giving them much problems were Christian and Moslem preachers. The question is, would they have done it, if they had been taught by their leaders?

In addition to the problems mentioned earlier, most of the respondents unfolded to us that they had reverted to the use of charcoal and firewood on account of frequent shortages and high prices of gas. Even though respondents knew that the usage of firewood and charcoal would lead to desertification and pollution of the air, they had to use them against their will. It is therefore incumbent upon the sitting government to see to it that measures are put in place to make sure there is constant supply of Liquefied Petroleum Gas at subsidized prices in order to safeguard the environment.

Again, the most wonderful responses we obtained were from people of the Islamic religion. They proved beyond reasonable doubt that Mohammed had ecological knowledge and therefore his followers also kept the environmental laws, but what we deduced was that Mohammed's ecological ideas or principles had not been fully

implemented or understood by his successors. It is true that some of the traditions recorded the sayings of the prophet about environmental issues but as to whether all his successors give it the same attention they give to other sins like adultery, stealing etc is not known now. We believe strongly that Moslems may become the best earth-keepers if they are galvanized into action by their leaders' lifestyles.

Also, the use of agrochemicals was stated as one of the things that were destroying the environment. The use of some insecticides and weedicides end up polluting the land, water bodies and destroying vegetation. Abbott Ansong affirmed that even though farmers were always advised not to leave waste materials on the surfaces of the soil, they paid deaf ears to it.

The last but not the least response was on modernity. There was a conflict between modernity and tradition in the course of the survey. People were trying to modernize all the traditional methods of preserving and protecting the environment by speaking against taboos and totems which were some of the mechanisms used by traditionalists to safeguard nature. The traditionalists thought that it was the reverence that they gave to nature that made other people hold it in high honour and therefore preserved it, but modernity on the other hand extirpated that fear and on account of that led to nature's degradation in the study areas.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY

The clear-cut objective of this thesis is to pinpoint and suggest some multifaceted roles religion can play in order to curtail the accelerating deterioration of the natural surroundings in Ejisu-Juaben Municipal Assembly and Kumasi Metropolitan Assembly. The Environmental Protection Agency and other stakeholders have been trying in diverse ways to curb the environmental degradation in the study areas but have not been able to achieve their aim. All the biological systems like the food chains and habitats and its physical systems like the water cycle and the ozone layer are being damaged because of industrial growth and deforestation. Since environmental degradation is a sin against God, humans and nature and can destroy the cosmic community, an attempt has been made to use the multi-faith principles in the study areas to provide lasting panaceas or cure-alls for the ecological crisis confronting the inhabitants. It attempts to teach that it is only religion that can lead people to be circumspect when dealing with environmental issues without any circumvention.

6.2 Conclusions

Despite the fact that there are many environmentally damaging projects facing the Ejisu-Juaben Municipality and Kumasi Metropolitan Assemblies, the most serious ones as far as the research is concerned are: deforestation, sand winning, water pollution, air pollution, noise pollution, improper disposal of waste, building on waterways and land pollution.

On deforestation, most of the respondents in the study areas were able to tell me the importance of trees to animals, insects, birds and human, but when they were answering the questions “*should humanity continue to fell trees and use them for construction?*”, they were indecisive because they thought until another thing was invented to play the role that wood was playing, trees would still be felled. A typical example that was given was wood for roofing buildings. Even though charcoal-making, the use of firewood in houses, weavers, the use of canes by teachers, improper methods of farming and many others were mentioned as some of the causes of deforestations by respondents, most of them especially farmers attributed it to concessionaires and chainsaw operators. They were surprised at the alarming rate at which trees were dwindling in the Ejisu/Juaben Municipal Assembly.

Apart from loss of forest, sand and stones winners have also become a very great threat to the natural environment in the Ejisu/Juaben Municipal Assembly. The situation was so horrible that most of the inhabitants had started crying for help because some of them had had their buildings either collapsed or inaccessible. People in areas like Asapong, Tikrom, Ejisu and many others were also complaining of their lands that were being degraded by sand and stones winners. In those areas large areas of land were almost treeless and full of gullies and waterlogged, breeding mosquitoes and making the areas somehow uninhabitable.

In spite of the problems being created by sand winners, water pollution is also a canker that needs to be dealt with in my areas of study. The Subin River in the Kumasi Metropolis is so polluted that if it flows into any drinking water the negative consequences might be disastrous. Studies have shown that it might contain lead,

leachates and other strong metals like mercury which when enter the blood stream may end up destroying tissues. A similar incident was also taking place at Ejisu where Kofi Ware, as well as Bafo, was being polluted. Surprisingly all those streams eventually join River Oda at Besease, in the E/J.M.A. Even though respondents did not want to call a spade a spade, there was a school of thought that some harmful chemicals were used in the remote areas to catch fish during the dry season.

What also needs to be redressed is air pollution. Although it is common in both assemblies it is worse in the K.M.A. because most of the industries in the Ashanti Region are located over there. In the course of the survey, the researcher realized even breathing was sometimes becoming difficult as a result of vehicular emissions; vehicles were so many in the K.M.A. that traffic jams had become the order of the day. At Magazine in the K.M.A. and other mechanics' shops, we saw a lot of air pollution going on. One dangerous practice which amazed us was how the mechanics and their apprentice were able to draw either petrol or diesel from car or lorry engines using their mouths. One of the things we learnt during the research was the presence of lead in petrol which is able to destroy gradually tissues in human body. This point may not be useful if the petrol is lead-free. Even here one may also ask if lead-free petrol is good for the human heart or not. The answer is absolutely no.

What must also be addressed apart from air pollution is noise pollution. It is also on the increase in both assemblies. While noise-making only went up in the E-J.M.A. during market days, it has now become a daily affair with the introduction of information centres. The people who were always blamed for excessive noise-making were Christians and Moslems. In the K.M.A. noise-making sometimes exceeded 90

decibels which might create health hazards. However, in other areas of it, it's between 50 and 60 decibels which were a bit normal. What we were told was that there were laws about noise-making but people had not been obeying them.

The next environmental problem that came out was poor disposal of both liquid and solid wastes in the two assemblies. It was realized in the course of the research that some people in the Kumasi Metropolis had a way of directing the scum and liquid in their septic tanks into gutters, especially during heavy rainfall. Even urine and other nasty liquid were believed to be thrown or poured onto streets and outside houses. The Ghana Statistical Service (2005) expatiated it as follows:

“The prominent method of liquid waste disposal in the districts is throwing it on streets outside of the dwelling unit. The proportions of households that use this method range from 14.2 percent in the Kumasi Metropolis, the only district with a proportion lower than 30.0 percent, to 67.5 percent in Ejisu-Juaben”.

Solid waste disposal was not different. Almost every place was a refuse dump for the inhabitants of the two assemblies at the time the research was on-going. This, according to the K.M.A. “has very serious financial and health implications”. Ghana Statistical Service (2005:114)

Building on water ways was common in the E-J.M.A. whereas in the K.M.A. the people were working hard to bring it under control. At Adarkwa-Jachie, Baworo, Tikrom, Asamang, Krapa, Besease, Donaaso, Asapong, and many other areas, buildings were so close to waterways that any heavy rainfall could cause destruction

of lives and properties. Because the watersheds of the streams had almost disappeared, we realized that some of them were showing signs of drying up. On accounts of this, Miss Sherry Ayitey, Minister of Environment, Science and Technology was once invited to Ejisu to deal with it to some extent.

The land has been defiled, degraded and rendered infertile in many parts of my study areas because of waste disposal, harmful chemicals and inadequate trees. Because every pollution takes place on the land it is the most vulnerable of all. As a result most of the respondents enumerated some changes that they had observed as follows: longer dry season, excess heat, irregular rainfall, early sunrise and sunset, hurricanes, etc.

6.3 Recommendations

At Anloga in Kumasi, continuous burning of saw – dust continuously polluted the air in that area for many years until the carpenters were relocated to another place called Wood Village.

Concerning bush burning and burning of dry leaves before farming activities begin, we recommend that a law is made and promulgated so that any form of burning becomes illegal. This may pressurize agric extension officers to introduce a new method of farming which will not require burning before planting starts. Burning has also been going on at Mayanka for many years but my fear is that if they continue to burn car tyres over there, pollution of the air will never cease in the K.M.A. and the nearby towns and villages.

Again, we strongly recommend that a ban is placed on any noise or sound that is above 90 decibels in both assemblies. Laws should be made for operators of information centres, traders, restaurant owners, hawkers, footballers and many other people whose work require a lot of shouting.

We also want to advise that enough dustbins should be provided so that littering will be brought to an end and also a law is made in order to prevent the inhabitants from disposing of their waste anyhow.

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Although we keep hearing of buildings that are destroyed every day for improper choice of sites, it still goes on. Accordingly, what the Town and Country Planning Officers have to do is to keep monitoring the waterways day and night so that those who build during the night may be arrested and imprisoned. We again advise that all the waste water in both assemblies are directed to one central point so that it can be purified and used for watering crops so that the water-bodies may not be polluted. Another point that needs to be mentioned is the introduction of Ecology in schools as a subject so that pupils and students will be conversant with the fundamentals of Ecology.

Furthermore, now that we have been told environmental degradation is a sin against God and may also lead to death, it has become a moral issue. We therefore recommend that all religious bodies develop environmental ethics as soon as possible.

We have to be careful of whatever we do on earth so that we don't continue to do

things that will deplete further the ozone layer. If this is done, it may eventually be institutionalized so that it will become part and parcel of everybody.

In conclusion, we should not forget Mante's advice that the current destruction of the ecosystems should be taken seriously in our theological construction.

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APPENDIX A
QUESTIONNAIRE DISPATCHED TO JUNIOR HIGH SCHOOL
STUDENTS AND TEACHERS

1. Is the natural environment being destroyed in your area?
2. If yes tell us how it's being destroyed.
3. Do you smoke? What are some of the bad effects of smoking?
4. Is bush burning common in your area?
5. Give four bad effects of bushburning.
6. Give two negative effects of overgrazing.
7. Explain why trees and animals should be protected in your area all the time.
8. Can you talk about the usage of firewood and charcoal in both your school and area?
9. Are insecticides, refrigerators and air conditioners common in your area?
10. If yes tell us the negative consequences of their usage.
11. Do you want to recommend another type of fuel for your people?
12. What is it?
13. Can we still rely on the traditional methods of protecting the environment?
14. Mention and explain three of them.
15. What will happen if the entire trees in your area are harvested?
16. What method of farming can you recommend for your people?
17. Talk about some of the changes you have observed in your environment.
18. Have Christians and Muslims got any role to play in this campaign against environmental destroyers?
19. If yes then tell what the Bible and Qur'an teach about ecology.
20. Can you talk about any environmentally damaging projects going on in your school?
21. If yes tell us about them.
22. Has your school got an environmental group?
23. If no why, and if yes, are you a member?
24. Mention four things your school has done or is doing in order to protect the environment.
25. Are the water bodies in your area being polluted?
26. How are they being polluted?

27. Do you think Ecology should be introduced and made an examinable subject in all Junior High Schools? Give reasons.
28. Can misuse of our natural resources create health hazards and reduce the life spans of humans? Give reasons to your answer.
29. (i) Is it ecologically unwise and naïve to misuse all the natural resources on this earth?
(ii) If yes give reasons and if no tell us why?
30. Land pollution may render the land infertile.
True/False
31. Do you think the use of certain chemicals can contaminate the soil?
Yes/No
Can you give examples?
32. If the land contains harmful chemicals, as soon as we eat the food, they will:
(i) Enter the soil
(ii) Cause leaching
(iii) Enter the food chain
33. What do the following cause in the atmosphere? Smokestacks of industry, chimneys of homes and apartments, exhausts of automobiles, incinerators and jet planes?
(i) I don't know
(ii) Atmospheric pollution
(iii) Atmospheric weather condition
34. When fossil fuels are burnt, gaseous pollutants are formed.
True/False
35. When coal and oil fuels containing sulfur are burnt by electric and industrial plants, sulfur dioxide is formed.
True/False
36. Sulfur dioxide is a heavy gas that causes a choking sensation when inhaled.
True/False
37. Nitric oxide (NO) is a pollutant released from internal combustion engines in automobiles.
(i) Did you know this?
(ii) If yes, explain.

38. Do you know that the above gaseous pollutant combines with oxygen in the air to form nitrogen dioxide (NO_2)?
39. Do you also know that nitrogen dioxide is a deadly gas?
- (i) Do you know that nitrogen dioxide combines with water or the moisture on your eyeballs or in your lungs to form nitric acid (HNO_3)?
 - (ii) Do you know that nitric acid is irritating to the lungs and in high concentrations it can be fatal?
40. A gas that is given off when wood, charcoal, oil and gasoline do not burn completely is referred to as
- (i) Carbon dioxide
 - (ii) Carbon monoxide
 - (iii) Carbon acid
41. Automobile exhausts are the major sources of this air pollutant.
True/False
42. Is carbon dioxide an air pollutant?
43. Does water in clouds and falling rain has a slightly acid pH?
44. Do you know that a precipitation with pH of less than 5.6 is called acid rain?
45. Acid rain is very destructive to plant life.
True/False
46. It is also corrosive on metal and stone surfaces.
- (i) True
 - (ii) False
 - (iii) I don't know
47. Can air pollution be caused by radiation?
- (i) Yes
 - (ii) No
 - (iii) I don't know
48. Can it be caused by particles that are carried great distances by air currents in the atmosphere?
- (i) Yes
 - (ii) No
 - (iii) I don't know
49. Do certain nuclear explosions produce strontium – 90?

50. When radioactive materials settle on the earth, they are taken up from the soil by plants.

True/False

51. What happens if these plants are eaten by animals?

52. What happens if human beings also eat the contaminated animals and plants?

53. When does the radiation destroy tissues and cause death from cancer or tissue damage?

54. Why should humans preserve the global environment?

55. Tell us why you think environmental degradation is a survival issue, especially for the developing countries.

56. How can this survival issue be solved in the developing countries?

57. Can the biosphere continue to absorb the effects of human activities?

58. If no why?

59. Are you environmentally friendly?

60. Write notes on each of the following: Pollution, green house gases and global warming.

61. Write down the things that can cause harm to the environment.

62. Do you see the rapid human population growth and accelerating deterioration of the environment of the earth as dual crises?

63. What will happen if we continue to manage forest without paying attention to maintaining the populations of mammals, insects, birds, and others?

64. Do automobile emissions reduce tree and crop production over large areas?

65. Can chlorofluorocarbons (CFCs) be used to pressurize spray cans?

66. Are they also used as refrigerants?

67. What things can reduce the ozone concentration in the upper atmosphere?

68. What has increased the amount of dangerous ultraviolet radiation that reaches the earth's surface?

69. Are industrial growth and deforestation increasing the levels of carbon dioxide, methane, and CFCs in the atmosphere?

70. Do you think the climate of the earth is changing?

71. If yes give reasons.

72. Is the temperature of the earth increasing?

73. If yes give reasons and if no tell us why?

74. If the temperature of the earth continues to increase, what will happen to the polar ice caps?
75. Can the change lead to a rise in the level of the sea and finally disrupt agriculture and shift ecological habitats across the landscape?
76. Can the shift in ecological habitats cause extinction of forms of life that will not be able to adjust to the change and its effects?
77. Give three negative effects of water pollution.
78. If the use of canes is also part of the destruction of the natural environment, what should teachers of today manufacture to replace the cane?
79. Can religion be the final arbiter?

APPENDIX B

QUESTIONNAIRE DISPATCHED TO ENVIRONMENTAL INSTITUTIONS

1. What serious environmental problems prevail in your area?
2. What mechanisms have been adopted to curtail the problem?
3. How effective are your mechanisms?
4. Should we still encourage exportation of timber? Give reasons to your answer.
5. Do you still see the activities of chain-saw operators as unlawful? Give reasons.
6. What about sand and stone winners?
7. Can it cause desertification? Explain.
8. Has illegal mining got serious environmental impact? Give reasons to your answer.
9. How can it be curtailed?
10. Can Christians and Muslims play any vital role in the campaign against environmental pollution and destruction?
11. If no, why and if yes, what do both the Bible and Qur'an teach about ecology?
12. Are the traditional ways of preserving the environment still binding?
13. Mention about four of them.
14. Do you have future plans to help keep and guard the environment? Write down some of them.

15. (i) Is any of your streams or rivers polluted?
(ii) If yes, what are the negative consequences and how are you going to stop water pollution in your area?
16. What are some of the chemicals used in polluting the water bodies in your area?
17. (i) Have you observed changes in the rainfall pattern in your area?
(ii) If yes, what are they?
18. (i) Is waste disposal one of the major environmental problems in your area?
(ii) Has there been a time that waste that has been deposited at a place created some health problems in that area? Please give reasons to your answer.
19. Is the human population in your area increasing rapidly?
20. (i) Are the rays of the sun extremely scorchy these days?
(ii) If yes, what are the causes?
21. (i) Has the ecological integrity of the forest in your area been disrupted?
(ii) If yes, why and how can it be renewed?
22. (i) Do people use harmful chemicals to catch fish in your area?
(ii) Can this have negative consequences on aquatic life, birds, other animals and humans? Give reasons to your answer.
23. Which animals have become extinct in your area?
24. Can misuse of our natural resources create health hazards and reduce the life spans of humans? Give reasons to your answer.
25. (i) Is it ecologically unwise and naïve to misuse all the natural resources on this earth?
(ii) If yes give reasons and if no tell us why?
26. Land pollution may render the land infertile.
True/False
27. Do you think the use of certain chemicals can contaminate the soil?
Can you give examples?
28. If the land contains harmful chemicals, as soon as we eat the food, they will:
(i) Enter the soil

- (ii) Cause leaching
 - (iii) Enter the food chain
29. What do the following cause in the atmosphere? Smokestacks of industry, chimneys of homes and apartments, exhausts of automobiles, incinerators and jet planes?
- (i) I don't know
 - (ii) Atmospheric pollution
 - (iii) Atmospheric weather condition
30. When fossil fuels are burnt, gaseous pollutants are formed.
True/False
31. When coal and oil fuels containing sulfur are burnt by electric and industrial plants, sulfur dioxide is formed.
True/False
32. Sulfur dioxide is a heavy gas that causes a choking sensation when inhaled.
True/False
33. Nitric oxide (No) is a pollutant released from internal combustion engines in automobiles.
- (i) Did you know this?
 - (ii) If yes, explain.
34. Do you know that the above gaseous pollutant combines with oxygen in the air to form nitrogen dioxide (NO₂)?
35. Do you also know that nitrogen dioxide is a deadly gas?
- (ii) Do you know that nitrogen dioxide combines with water or the moisture on your eyeballs or in your lungs to form nitric acid (HNO₃)?
 - (iii) Do you know that nitric acid is irritating to the lungs and in high concentrations it can be fatal?
36. A gas that is given off when wood, charcoal, oil and gasoline do not burn completely is referred to as:
- (i) Carbon dioxide
 - (ii) Carbon monoxide
 - (iii) Carbon acid
37. Automobile exhausts are the major source of this air pollutant.
True/False

38. Is carbon dioxide an air pollutant?
39. Does water in clouds and falling rain has a slightly acid pH?
40. Do you know that a precipitation with pH of less than 5.6 is called acid rain?
41. Acid rain is very destructive to plant life.
True/False
42. It is also corrosive on metal and stone surfaces
- (i) True
 - (ii) False
 - (iii) I don't know
43. Can air pollution be caused by radiation?
- (i) Yes
 - (ii) No
 - (iii) I don't know
44. Can it be caused by particles that are carried great distances by air currents in the atmosphere?
- (i) Yes
 - (ii) No
 - (iii) I don't know
45. Do certain nuclear explosions produce strontium-90?
46. When radioactive materials settle on the earth, they are taken up from the soil by plants.
True/False
47. What happens if these plants are eaten by animals?
- (i) Strontium-90 disappears
 - (ii) The animals become strong
 - (iii) Strontium-90 is deposited in the flesh, milk and bones of those animals.
48. What happens if human beings also eat the contaminated animals and plants?
- (i) Strontium-90 will be deposited in human bones.
 - (ii) Strontium-90 is eradicated
 - (iii) I don't know

49. When does the radiation destroy tissues and cause death from cancer or tissue damage?
- (i) I don't know
 - (ii) When a certain concentration is reached
 - (iii) After breathing
50. Why should humans preserve the global environment?
51. Tell us why you think environmental degradation is a survival issue, especially for the developing countries.
52. How can this survival issue be solved in the developing countries?
53. Can the biosphere continue to absorb the effects of human activities?
54. If no why?
55. Are you environmentally friendly?
56. Write notes on each of the following: Pollution, green house gases and global warming.
57. Write down the things that can cause harm to the environment.
58. Do you see the rapid human population growth and accelerating deterioration of the environment of the earth as dual crises?
59. What will happen if we continue to manage forest without paying attention to maintaining the populations of mammals, insects, birds and others?
60. Do automobile emissions reduce tree and crop production over large areas?
61. Can chlorofluorocarbons (CFCs) be used to pressurize spray cans?
62. Are they also used as refrigerants?
63. What things can reduce the ozone concentration in the upper atmosphere?
64. What has increased the amount of dangerous ultraviolet radiation that reaches the earth's surface?
65. Are industrial growth and deforestation increasing the levels of carbon dioxide, methane, and CFCs in the atmosphere?
66. Do you think the climate of the earth is changing?
67. If yes give reasons.
68. Is the temperature of the earth increasing?
- Yes/No
69. If yes give reasons and if no tell us why?

70. If the temperature of the earth continues to increase, what will happen to the polar ice caps?
- (i) They will not melt
 - (ii) They will melt
 - (iii) They will be hot
71. Can the change lead to a rise in the level of the sea and finally disrupt agriculture and shift ecological habitats across the landscape?
72. Can the shift in ecological habitats cause extinction of forms of life that will not be able to adjust to the change and its effects?
73. Give three negative effects of water pollution.
74. What are the negative effects of leachates?
75. Can religion be the final arbiter?

APPENDIX C

QUESTIONNAIRE DISPATCHED TO FARMERS, AGRICULTURAL EXTENSION OFFICERS AND TRADITIONALISTS

1. Talk about some of the environmental changes you have observed in the Ejisu/Juaben Municipal Assembly.
2. What will happen if all the trees in your area are harvested?
3. Which people take care of timber trees?
4. Are they consulted before the trees are handed over to concessionaires?
Give reasons.
5. Do concessionaires pay royalties to the right people?
6. If 'No', tell us what must be done.
7. Can you talk about insecticides or chemicals that are used by farmers and fishermen?
8. If 'yes' what are their negative effects?
9. What method of farming is common in your municipality?
10. What is the recommended method of farming in your area?
11. Do you prefer the use of firewood and charcoal to gas?
12. If 'yes' why?
13. Do you know why environmentalists have been advising people to use gas as their fuel?

14. If 'yes' tell us.
15. Do you support timber or sawn timber exports?
16. If 'No' why? If 'Yes' why?
17. Do you know about any mining activity in this area? Tell us.
18. Do farmers pollute water bodies? How do you know?
19. Tell us how farmers dispose of waste on their farms.
20. Are the traditional methods of preserving the environment still binding?
21. How many of them are practised in your area?
22. Is the human population in your area increasing rapidly? Give reasons.
23. Are the rays of the sun extremely scorchy these days? Give reasons.
24. Give two bad effects of global warming.
25. Do you smoke cigarette or use tobacco?
26. Do you know its bad effects on humans and the environment?
27. Is bush burning common in your area?
28. Give three bad effects of bush burning.
29. Have farmers been relegated to the background?
30. If yes, explain.
31. Can religion be the final arbiter?

APPENDIX D

QUESTIONNAIRE DISPATCHED TO CHURCHES AND PASTORS

1. Do you agree that environmental reduction (degradation) is a sin against God?
2. Are greed of the rich and poverty of the poor the main reasons why the environment is being destroyed?
3. Does the church preach against selfishness, greed and idleness?
4. If 'yes' can we make environmental protection one of the rudiments of Christianity?
5. Can environmental reduction be compared to murder or suicide? Give reasons to your answer.
6. What should be done to members of the church who pollute the water bodies?
7. Why do you think environmental destruction is dangerous to humans, animals and plants?

8. Can you talk about some environmentally damaging projects going on in your area?
9. What plans of action has your church put in place to make sure people who destroy the environment desist from it?
10. Why do many churches site their churches close to water bodies and end up destroying the watersheds?
11. What did God mean when he said humans should have dominion over the created things?
12. Did God say that nature should be exploited by humans? Give reasons to your answer.
13. What are some of the causes of death among church members?
14. Explain why you think water pollution, land pollution, air pollution and sound pollution can lead to health hazards and deaths eventually.
15. How do you interpret the following scriptural verses: Genesis 1:27-30 and Deuteronomy 22:67?
16. Why do you think environmental protection will lead to longevity as well as prosperity?
17. What are the causes of the global warming nowadays?
18. Which of the following are the causes of the environmental problems Ghanaians are facing of late?
19. Enumerate ten changes you have observed in the climate of your area.
20. According to the Bible, diseases are caused by:
21. Can you quote one verse in the New Testament indicating Jesus Christ once taught his disciples the importance of environmental protection?
22. If 'yes' quote and if 'no' would you say Jesus supported exploitation of nature?
23. What negative effects has the depletion of the Ozone Layer brought on humans, animals and plants?
24. Why do you think the Public Address System should be used anytime you are worshipping?
25. Do you know that too much noise can create health problems for humans? Expatiate on this.
26. Which of the following fuels do you prefer?
Gas () Charcoal () Fire wood ()

27. Are poor people at liberty to exploit nature in order to make ends meet? Give reasons to your answer.
28. What will happen to Christians who exploit nature as a result of greed?
29. Do you have problems with automobile emissions in your area?
30. Expatriate on stewardship.
31. Do the gospels urge Christians to protect the environment?
32. How do you understand the ecological triangle?
33. Can religion be the final arbiter?

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APPENDIX E

QUESTIONNAIRE DISPATCHED TO MUSLIMS

1. Do you agree that environmental reduction (degradation) is a sin against Allah?
 Yes
 No
 I don't know
2. Do you agree that Mohammed had ecological wisdom? Give reasons to your answer.
3. What do the Qur'an and the various traditions teach about water, air, land and noise pollution?
4. Are greed of the rich and poverty of the poor the main reasons why the environment is being destroyed?
5. Do Moslems preach against selfishness, greed and idleness?
6. Are poor people at liberty to exploit nature in order to make ends meet? Give reasons to your answer.
7. What will happen to Moslems who exploit nature as a result of greed?
8. Can we make environmental protection one of the rudiments of Islam?
9. Can environmental degradation (reduction) be compared to murder or suicide?
10. Should the leadership of Islam ex-communicate those who exploit nature to the extent that it causes health problems for Ghanaians?
11. Why do you think environmental destruction is dangerous to humans, animals and plants?
12. Which environmentally damaging projects are going on in your area?

13. What courses of action have your Imams put in place to make sure people who destroy the environment desist from it?
14. Mention ten causes of death among Moslems.
15. Explain why you think water, land, air and sound pollution can lead to health hazards and deaths eventually.
16. Why do you think environmental protection will lead to longevity as well as prosperity?
17. What are the causes of the current global warming?
18. Which of the following are the causes of the environmental problems Ghanaians are facing of late?
 - A. Witchcraft (Abayis[m])
 - B. Humans
 - C. God
19. Enumerate ten changes you have observed in the climate of your area.
20. According to the Qur'an or Hadith, diseases are caused by:
 - A. Witchcraft (Abayis[m])
 - B. Satan
 - C. Humans
 - D. Allah
 - E. I don't know
21. Which of the sayings of Mohammed do you think urges Moslems to take good care of their environment.
22. What negative effects has the depletion of the ozone layer brought on humans, animals and plants?
23. Why do you think the Public Address System should be used anytime you are worshipping?
24. Do you know that too much noise can create health problems for humans? Expatiate on this.
25. Which of the following do you prefer?
 - Gas
 - Charcoal
 - Firewood
26. Is the human population growing rapidly in the Moslem communities? Give reasons.

27. Are there enough trees at Zongos? Tell us why?
28. How do the Zongo people dispose of their waste?
29. Is your area smelly?
30. How do drivers pollute the air in your area with their vehicles' emissions?
31. Can religion be the final arbiter?

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APPENDIX F



This is one of the places in the Ejisu-Juaben Municipality near Fumesua where wood is sold by some people without thinking about its negative effects on the environment.



Wood sellers are also happily doing their business here.

APPENDIX G



These condemned fridges were taken out of the Subin River at Anloga, Kumasi.



Some of the workers of the Drains Maintenance Unit were at work as at the time the picture was being taken.

APPENDIX H



Indiscriminate harvesting of trees is still going on in the Ejisu-Juaben Municipality. In the course of the research, the researcher sometimes counted about twenty trucks a day carrying timber from the Ejisu-Juaben Municipality to some parts of the country.

APPENDIX I



At the time this picture was being taken at Fumesua, in the Ejisu-Juaben Municipality, the timber truck above had been broken down because the weight of the logs was too heavy for the vehicle.

APPENDIX J



Waste materials including those belonging to the Zoomlion Waste Management Organisation had also been dumped at Serwaa Akuraa at the time the picture was being taken.

APPENDIX K



Is this boy standing at the top of this refuse dump safe?



This part of the Subin River has also been polluted.

APPENDIX L



Poor sanitation at Serwaa Akuraa, Ejisu.



This stream (Kofi Ware, Serwaa Akuraa at Ejisu) has been polluted by leachates from a refuse dump so people don't drink it but surprisingly at the banks of the stream are wells and sugarcanes. Are not the sugarcanes and the water from the wells being polluted through seepage?

APPENDIX M



This Subin River at Anloga, Kumasi, has been absolutely polluted.

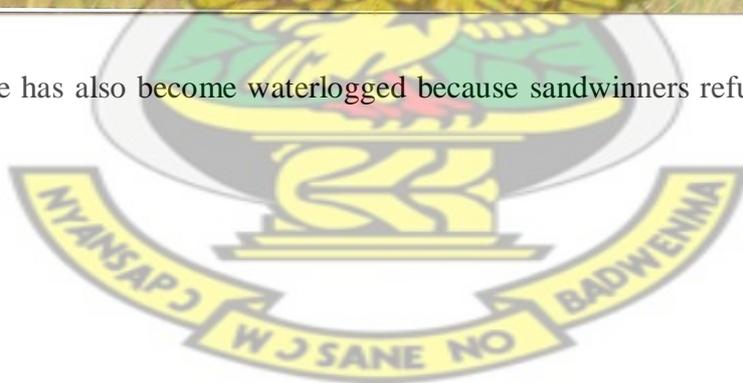


This building and several others have been abandoned at Asaapong near Onwi as a result of sandwinning.

APPENDIX N



This place has also become waterlogged because sandwinners refused to reclaim the land.



APPENDIX O

i. MAJOR MARKETS OF GHANA'S WOOD PRODUCTS EXPORTS:

JANUARY TO SEPTEMBER 2007 – 2008

MARKET REGIONS	2007	2008
	January – September Volume (m ³) “000”	January – September Volume (m ³) “000”
Europe	119.55	144.00
Asia/far east	107.97	90.80
Africa	107.25	132.50
Middle east	21.42	22.11
America	40.87	38.76
Oceania	2.29	1.91
TOTAL	399.36	

2007	2008
January – September Volume (Euro) million	January – September Volume (Euro) million
58.75	62.87
24.52	23.07
29.54	31.43
6.33	7.88
18.47	17.21
0.94	1.95
138.55	144.42

**ii. EXPORT OF TIMBER AND WOOD PRODUCTS TO ECOWAS
COUNTRIES**

JANUARY-SEPTEMBER 2007/2008

January – September (2007)
(2008)

January – September

Country	Volume (M ₃)	Val(Euro)	Unit price	Volume (M ₃)	Val(Euro)	Unit price
Senegal	8,963	2,109,015	235	9,659	2,414,472	250
Nigeria	6,869	17,328,483	305	70,292	21,709,550	309
Niger	2,262	1,710,399	139	11,943	1,856,989	155
Mali	239	23,644	99	319	35,566	111
Burkina Faso	6,133	1,029,600	168	7,475	1,632,960	218
Togo	5,470	1,541,318	282	7,431	1,629,859	219
Benin	2,191	386,527	176	3,475	873,534	251
Gambia	410	82,163	200	363	107,988	297
Sierra Leone	113	26,900	238	297	83,200	280
Total	92,650	25,291	183,273	111,254	30,348,324	2,090



**iii. COMPARATIVE EXPORT STATISTICS FOR TIMBER AND
WOOD PRODUCTS**

JAN-SEPT 2007/2008

Product	2007 Volume (m³)	2008 Volume (m³)	2007 Volume (Euro)	2008 Volume (Euro)
Lumber (KD)	87,578	91,347	34,357,543	35,999,692
Lumber (AD)	62,440	54,725	19,249,307	15,879,174
Lumber (Overland)	3,245	2,514	370,117	192,821
Boules (AD)	4,755	3,113	2,382,100	1,563,173
Boules (KD)	200	124	97,250	55,783
Poles	60,672	71,066	12,112,022	13,103,262
Plywood	16,990	11,441	4,460,608	3,414,546
Plywood (overland)	77,530	93,519	21,628,095	26,853,120
Sliced Veneer	27,872	31,488	22,760,415	25,197,429
Rotary Veneer	23,168	24,906	5,424,610	6,075,994
Curly Veneer	165	112	1,665,089	1,041,622
Mouldings	21,945	19,297	9,486,970	8,753,698
Furniture parts	231	41	457,576	74,093
Parquet/Flooring	1,921	1,956	1,839,709	1,494,208
Dowels	685	762	443,385	484,955
Billet	7,575	22,222	1,383,988	3,568,252
Block Boards		1,012		272,724
Powdered Barks		2		237
Profile Boards	8	77	9,736	48,376
Layons	171	358	361,628	262,831
Broomsticks	110		35,166	
TOTAL	399,361	430,081	138,549,110	144,415,992

Jan – Sept. 2007

Volume: 399,361 M³

Value: Euro 138,549,110

Jan – August 2008

% Change

Volume: 430,081 m³ 7.69

Value: Euro 144,415,992 4.23

KNUST



APPENDIX P

i.

Table 1.3: Selected population indicators

Background characteristics	Frequency	Percentage
Nationality		
Ghanaian by Birth	3,612,950	100.0
Naturalized Ghanaians	3,154,860	87.3
Other ECOWAS National	185,469	5.1
African, other than ECOWAS	133,237	3.7
Non-African	75,336	2.1
	64,048	1.8
Ethnic Group		
Ghanaians by Birth	3,154,860	100.0
Akan	2,453,088	77.9
Ga-Dangme	43,226	1.4
Ewe	99,658	3.2
Guan	53,878	1.7
Gurma	47,947	1.5
Mole-Dagbon	282,420	9.0
Grusi	74,568	2.4
Mande-Busanga	56,460	1.8
All Others	38,615	1.1
Religious affiliation		
Total	3,612,950	100.0
Catholic	567,229	15.7
Protestant	709,324	19.6
Pentecostal/Charismatic	990,979	27.4
Other Christian	534,154	14.8
Islam	477,214	13.2
Traditional	43,583	1.2
Other Religion	25,328	0.8
No Religion	265,139	7.3
Population/Social characteristics		
Population	3,612,950	100.0
Male	1,818,216	50.3
Female	1,794,734	49.7
Share of National Population	-	19.1
Urban Population	1,853,065	51.3
Rural Population	1,759,885	48.7
Dependent Population (<15 and >64)	1,737,145	-
Adult Population	1,883,763	48.1
		52.1

Source: 2000 Population and Housing Census. Ghana Statistical Service.

Table 2.5: Population trends in the Ashanti Region (1960-2000)

Census Year	Population			Proportion (%)		Share of Nat. Pop.	Male %	Female %	Pop. Density/	Growth rate
	Total	Urban	Rural	Urban	Rural					
1960	1,109,133	276,772	832,361	25.0	75.0	16.5	51.2	48.8	45	-
1970	1,481,698	440,526.0	1,041,172	29.7	70.3	17.3	49.8	50.2	61	2.9
1984	2,090,100	679,750	1,410,350	32.5	67.5	17	49.2	50.8	86	2.5
2000	3,612,950	1,853,065	1,759,885	51.3	48.7	19.1	50.3	49.7	148	3.4

Source: 1960, 1970, 1984 and 2000 census reports. Central Bureau of Statistics and Ghana Statistical Service.

