

**THEOLOGICAL REFLECTION ON ENVIRONMENTAL DEGRADATION
AND VICIOUS CYCLE OF POVERTY**

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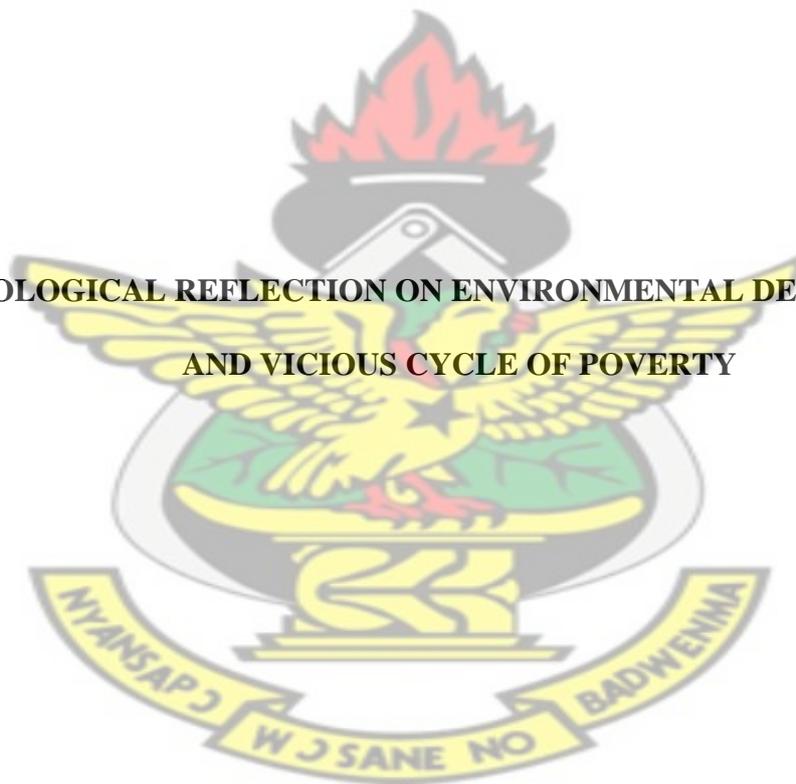
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DECLARATION

I declare that apart from the sources specifically acknowledged in the thesis, this work constitutes the result of my research in the subject and it has not been submitted in part or whole to any other Secondary of University.

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Signature

Date



DEDICATION

I dedicate this work to Almighty God who gave me in-depth knowledge and insight to go through this thesis successfully. I also dedicate the work to my son Evans Obeng Boateng and my two nephews Prince Osei Marfo and Barima Yaw Dwomoh Mensah for their prayers during the period of this work.

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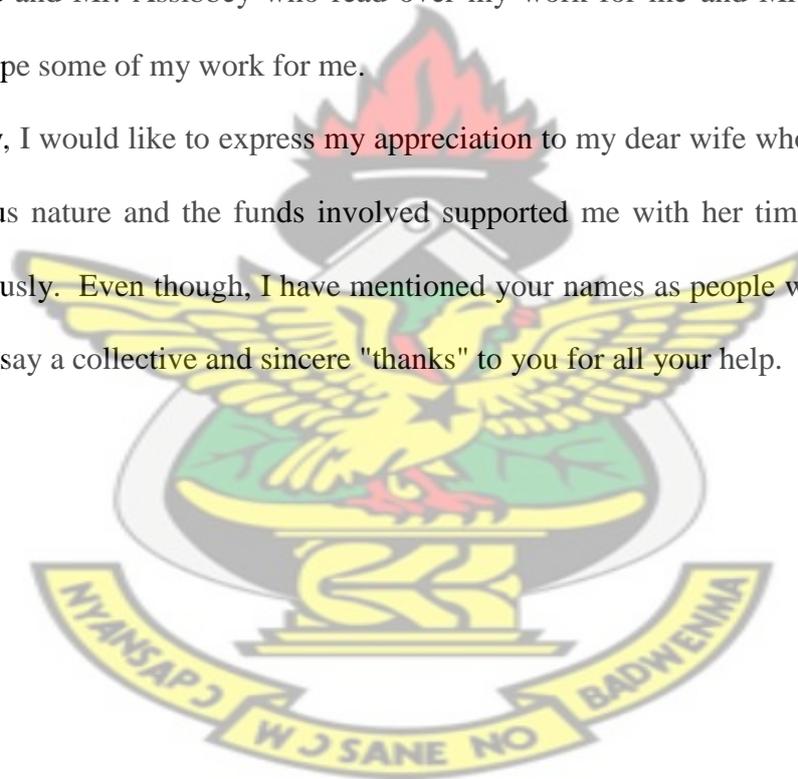


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ABSTRACT

The poor generally have access only to areas that have higher risk for health and income generation, and they generally lack the resources to reduce the exposure to the risk or to invest in alleviating the causes of such risk. Environmental degradation therefore affects the health and nutrition status of the poor and lower their productivity. The main objective of the study was to examine the Christian attitude towards the environment and vicious cycle of poverty. Interviews and questionnaires were used to collect data from officials of EPA, mining companies, 'galamsey' and church members. The study revealed that as people become poorer, they destroy the resources faster. They tend to overuse the natural resources because they do not have anything to eat or any means of getting money except through the natural resources. Poor people often lack sufficient income and education to afford higher quality life. The study further revealed that some communities are denied access to good drinking water due to mining operations. The problems of environmental degradation and water availability has also meant that in some areas, affected communities rely to a great extent, particularly in the dry season, on water sources that are increasingly polluted by chemicals from mining operations. It was realized that maintaining year round access to safe abundant supplies of water was a significant problem for communities affected by mining activities. It was recommended that churches should preach and educate its congregation that the fragile environment on which they depend for their survival is being neglected or over-exploited, and it is now necessary to rehabilitate it and manage it sustainably. It is recommended that there is the need for the churches to have a theological reflection that will help to change their attitude towards the environment. Churches should also teach its members that the environment belongs primarily to them, and

they must take the responsibility for the land and organize themselves in groups, cooperatives, development associations and local associations to defend it. There is also the need for churches to promote a Christian Fund and similar mechanisms for directing funds to environmental awareness projects.

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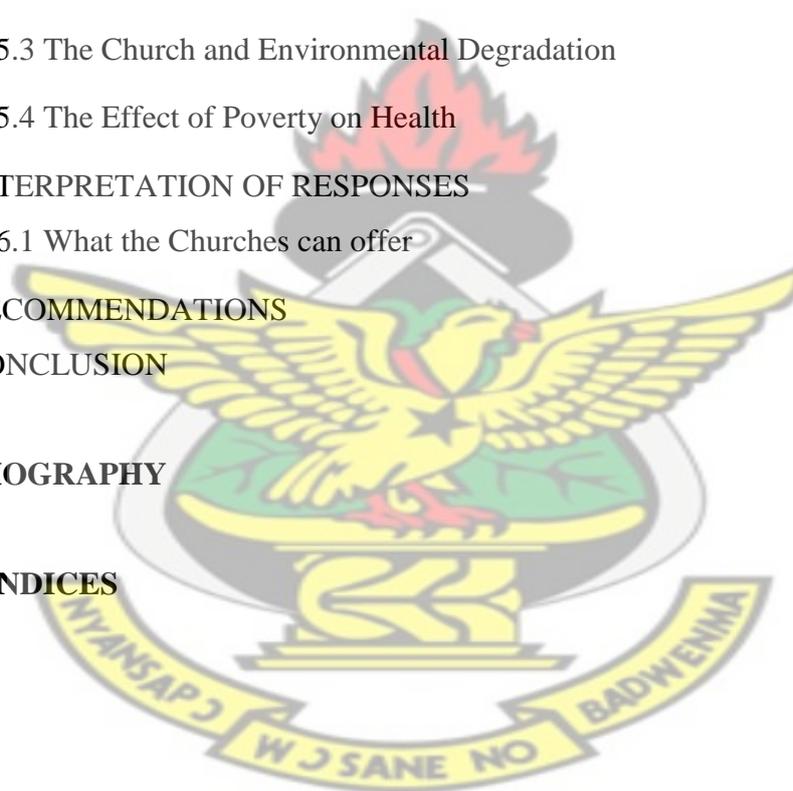
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CHAPTER ONE

GENERAL INTRODUCTION

1.0 BACKGROUND TO THE STUDY

"So God created humankind in his own image, in the image of God he created them; male and female he created them. God blessed them, and God said to them "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth" (Gen. 1:27-28).

These expressions have generated a lot of controversies and comments from a lot of scholars. According to Theodore Heibert, of all the biblical texts brought into discussions about the human place in nature, and about environmental values in the Bible and in Western religious traditions none has been quoted more frequently and with more emotion than Genesis 1:28. And within this verse, no concept has been debated more fervently than the meaning of dominion. Dominion is the concept people are most familiar with and most curious about when the topic of the Bible and the environment is raised.

Bird Phyllis writes that, the impeccable fact about the biblical term "dominion" from the Hebrew verb "raddash" is that it grants humans the right and responsibility to rule, to govern the rest of creation. He stated further that similar conclusions may be drawn about the phrase "subdue the earth" in Gen. 1:28. The verb "subdue" from the Hebrew word kavash depicts a hierarchical relationship in which humans are positioned above the earth and are granted power and control over it. This according

to Young (1944), gives humankind a divine sanction to plunder the environment for selfish interest. Christians were not sanctioned to plunder the environment for their own good but rather as stewards of nature. They are asked to be responsible in good faith, rather than exploit and destroy the environment.

1.1 DEFINITION OF TERMS

Environment generally refers to a natural-resource base that provides sources (material energy, and so forth) and performs “sink” functions (such as absorbing pollution). The term can include resources that people relied on in the past but no longer rely on (either because they are depleted or because they have been substituted by some other resource or technology). Similarly, it can include resources that people do not yet use, but could use with a change in knowledge or technology (Leach and Mearns, 1991).

Schaeffer (1972) describes the ecology as the study of the balance of living things in nature. The term degradation can be interpreted in different ways indicating different forms of land use (Blakie and Brookfield 1987). As a working definition this paper uses the term “environmental degradation” to imply:

(a) Depletion: Damage to a natural resource system that affects present or future human needs negatively. This harms welfare indirectly by reducing productivity. We refer to depletion of a renewable natural resource beyond its rate of renewal, rather than depletion of a finite resource.

(b) Pollution: damage to human health or decline in the capacity of the environment to sustain natural systems, thus directly harming welfare.

According to the Oxford Dictionary of Environment and Conservation, environment is all the external abiotic and biotic factors, conditions and influences that affect the life development and survival of an organism or a community. Environmental degradation describes the erosion of the natural environment through the depletion of the natural resources, the destruction of ecosystem that is flora and fauna and the extinction of animal species and plants. In general environment refers to the surroundings,

- The natural environment, all living and non living things that occur naturally
- The physical and biological factors along with the chemical interactions that affect the organisms
- The culture that an individual lives in.

1.2 STATEMENT OF THE RESEARCH PROBLEM

Lands in the country have been exploited resulting in diverse environmental problems. The improper management of land resources has resulted in social, political and environmental crisis. Poor land management have had massive effects on the land. The poor generally have access only to areas that have higher risk for health and income generation, and they generally lack the resources to reduce the exposure to the risk or to invest in alleviating the causes of such risk. Environmental degradation affects the health and nutrition status of the poor and lower their productivity. Due to the lack of sufficient income, people start to use and overuse every resource available to them when their survival is at stake. As the people become poorer, they destroy the resources faster. They tend to overuse the natural resources because they do not have anything to eat or any means of getting money except through the natural resources. According to Norton et al. (2000), poverty is

considered as a great influence of environmental degradation. The combination of poverty and drought can have serious environmental consequences that threaten future agricultural productivity and the conservation of natural resources.

The voice of the Christian family had not been as strong as expected of people whose faith demands that they protect nature. The creation of the world was for a purpose. It has not been set without purpose or divine direction. If the creation was done with an intention, then humankind must do all that they can to preserve the things that God created. If Christians or humankind cherished the things been created by God, then there is something that must be done. The preservation of nature should be very critical to the church because it serve as the foundations of human existence.

Though humanity has the ability to make development sustainable and to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs, environmental degradation, including land degradation has continued to worsen, exacerbating further poverty and food insecurity over the past two decades. It is for this reason that this research seeks to assess environmental degradation and its effects on the vicious cycle of poverty.

1.3 OBJECTIVES OF THE STUDY

The objectives of the study were to examine the Christian attitude towards the environment and vicious cycle of poverty. The study sought to address five objectives. The first was to examine how the environment has been degraded and vicious cycle of poverty in Amansie West, second, to explore the factors causing environmental degradation and the vicious cycle of poverty, third, to examine the

Churches' view on the environmental degradation and the vicious cycle of poverty, four, to identify the effects of environmental degradation on humankind and five, to investigate the challenges faced by the churches in managing the degraded environment and the vicious cycle of poverty and finally effect of climate change on the environment.

1.4 SIGNIFICANCE OF THE STUDY

The environmental degradation has influenced plant productivity, soil fertility, water quality, and many other local and environmental conditions that ultimately have affected human welfare (Owusu-Koranteng, 2010). The study will therefore be a contribution to the emergence of adequate ecological solutions facing the world. It will also help churches to adopt a pragmatic approach in managing the degraded environment because the destruction of the environment is a threat to human survival. It will also help to address the vicious circle of poverty which is a serious concern. In addition it will show the clear picture of the rate at which the environment is been degraded in Amansie West.

A study of this nature would not only add to the existing canon of knowledge on retention management, but would also help policy makers appreciate the nature of the degradation of the environment so that appropriate models can be developed to remedy the problem. In the academic community, the study can serve as important reference material and further highlight on areas where further empirical studies could be conducted to better equip policy-makers and all stakeholders concerned.

1.5 LIMITATIONS OF THE STUDY

One limitation of the study was getting information and assistance from some of the churches and organisations visited, which took a rather lengthy time due to the laid down procedure the researcher had to go through. Getting the questionnaires filled out as completely and accurately as possible was also a set back since most of the respondents were either not willing, did not take the questionnaires seriously, or did not have the time to spare.

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1.6 METHODOLOGY

The research methodology employed in the study was that of phenomenological, historical and empirical approaches. Rott (2000) indicated that the phenomenological approaches derive its conclusions based on investigations and qualitative data and allows the investigation to guide the project. Merian (1994) emphasized that a research must be conducted by observing the situation through a searching process. Both primary and secondary data were used. Primary data was gathered from interviews and questionnaire administered. According to Merian (1994), interviews are best forms of collecting evidence if the researcher wants to find facts that cannot be observed. Secondary data was also assessed to get a better understanding of the literature on the environment, nature, creation and ecosystem. In addition, the researcher assessed information from books on environmental degradation and its effects. Print and electronic as well as internet were the other sources of information assessed.

1.7 AREA OF THE STUDY

The study focuses on the degraded environment and vicious circle of poverty in the Amansie West and the Churches' response. It also looked at some of the factors that have contributed to environmental degradation and management practices that could be adopted by the churches' to solve the problem and make recommendations as such.

1.8 LITERATURE REVIEW

Environmental degradation has become a serious concern to the people of Amansie West as well as Ghanaians as a whole. Interested people like the environmentalist, Christians, Muslims and Traditionalist have written on environmental degradation. This aspect will look at various issues already raised by authors in the form of books, journals and articles.

Young (1944) writes, the ecological crisis has presented a significant challenge to the traditional Christianity. There are several reasons for a positive Christian response. First, there is still a need to vindicate Christianity and the scriptures from misguided accusations. Many ecoactivists have generalized set of indictments against the Christian faith. Christianity is still being represented as opposed to nature and as the cause of the present ecological crisis. Believers should be able to repudiate such notions and demonstrate by a transformed life that Christianity is not a threat to the environment.

Grey (1998) writes, the suffering of creation today is far more serious than in Jeremiah's day. The cries of the fallen forest, the dying deserts and the acid air now enveloped the earth. It is an axiom of social justice that the true nature, depth and

force of any injustice can only be understood by those experiencing that injustice. Their voice must be heard first, taken with the utmost seriousness and made an integral part of the process of justice. So too with justice for the earth.

Nash (1938) writes, according to Gen 1:26-28, to be the image of God and to exercise dominion in relation to all other life forms must be understood. The meaning of these two related concepts has been the subject of numerous speculations and debates among exegetes and theologians in Christian history. Rarely, however, has the debate been on centre stage. He continues that the situation also requires a major redefinition of human needs and wants in relation to “quality of life”.

Abrahams (1967) writes there is a crucial link to be made between social justice and ecology; the latter is an issue of concern not just within the richer countries. Once nature was thought to be an object for exploitation by developers today, scientists are increasingly concerned about ecology. Ecology should be seen as involving both political and social justice. Thus justice concerns the whole cosmos and not simply human being. Economic degradation, poverty and the ecological crisis are linked, making us more aware of our dependence upon earth and of the God-human-world relationship. Theology today is shifting from anthropocentrism to an ecological orientation, even within a liberation perspective. Science and technology have often thought of human as being above nature.

Clark (1986) stated, faced by this sort of prospect, Christians may care to reconsider their position. What is our responsibility for the environment; the natural context of our lives and culture? Is it really our duty to use all things so as to preserve and

elevate the distinctive human life, maybe engineering little enslaves within which “nature’ can be painlessly inspected the claim that this is need our duty rest upon a high doctrine of human life, not merely on the hope and desire for enjoyments of a land than other creatures.

Togarasei (2008) states that, our planet facing an environmental crisis has long been observed. Evidence still abounds in the form of loss of animal and plant species, land degradation, depletion of energy resources, and climatic change, to mention but few. He further stated that, climate change is a concern of not only government and environmental organizations. Even individuals are feeling the effects of climate change. The Southern African region for example is reeling from some of the effects of the ecological crisis. In 2008, floods affected farming and even led to loss of human lives in Zambia, Zimbabwe, Mozambique and parts of Botswana.

Frazier in the Daily Graphic (2009) writes, the sprawling 700 hectares or so what used to be prime agricultural lands is located in the Northern part of Avenor District. The proliferation of tree varieties was impressive. There was a large area of crump of big trees and shrubs that could pass for a forest. They harbour animals such as deer, monkeys, foxes and occasional bush pigs. As for birds they were plenty. The area was blessed with loamy soil. By the time of his last visit in 1978 from 1957 the whole forest was like a desert.

Schaeffer (1972) states that, the use of DDT on land is polluting the whole sea. It is coming down through the rivers out into the ocean and causing the death of sea-feeding birds. He continue that when Thur Heyerdahl made his famous voyage in

the Kon Tiki, he was able to use ocean water quietly and freely, but he says that when he recently tried to cross the Atlantic in a papyrus boat, the ocean water was unusable because of the large amount of rubbish.

Young (1994) said, one of the most common charges against Christianity is that God's insinuation in Genesis 1:28 to subdue the earth and have dominion over it gives humankind a divine sanction to plunder the environment for selfish interest. In his book "the Power of Myth", Joseph Campbell said that the idea of human dominance over nature is not simply a characteristic of modern Americans. It is rather the biblical condemnation of nature which they inherited from their own religion and brought with them mainly from England. God is separated from nature is condemned of God. It's right there in Genesis; we are to be masters of the world.

Obeng (1980) writes, it is worth reminding ourselves again that this planet earth is the only one on which as far as we know life can exist; that for life to exist, we depend on, and draw from resources which have evolved over millions of years and which answer our specific needs which make life possible. We need the oxygen in the atmosphere which is essential for our physiological needs in order to release energy for our use; we need the plants which have evolved the ability to use up the waste carbon dioxide which generate and in so doing, replenish the global supply of oxygen; we need the complex process by which energy from the sun, which is the primary source of energy on our planet, can be locked up by the planets in the form of food for our later use; we need the hydrological cycle which keeps order of the process of making water available not for only us but also for the plant which like us, cannot function satisfactory without it. We need the nitrogen cycle through which

important and basic elements for producing living tissue are assured; we need the biogeochemical process, as well as nutrients chemicals; we need the carbon cycle to which complex forms of organic materials are related. We need all of them to function effectively in order to sustain the resources on which our lives depend.

Obeng (1980) writes; since we know that to survive on this planet we need its resources, we should also very well appreciate that our primary concern should be the survival of the resources and the environment which make the planet suitable for our lives. She further stated, as we use the resources of the environment for development we must respect the order which characterizes biosphere systems.

Breuilly and Palmer (1992; 47) expressed that, it is becoming increasingly clear that what has been named the ecological crisis is perhaps the number one problem facing the world-wide community of our times. It is a global problem, concerning all human beings regardless of where they live or their social class. He went further to say that, it is a problem that is not simply to do with the well-being of humanity but with the very being of humanity and perhaps of creation as a whole. It is difficult to find any aspect of what we call "evil" or sin that is so all-embracing and has such devastating power as the ecological evil. This material will help me to compare my results to what others have said concerning the ecological crisis.

Obeng (1980) maintains that, as for environmental pollution resulting from nuclear explosions and radiations from the little that has been experienced so far, they provide a potent predisposition to diseases from nuclear fission which is a bone-seeking isotope whose distribution is believed to extend from the atmosphere to the soil and the sea. The ecological crisis is serious as depicted in this extract from a

communiqué issue by the World Council of Churches Consultation at Baixada Fluminense, Brazil in 1992,

“The earth is in peril. Our only home is in plain jeopardy. We are at the precipice of self destruction. For the very first time in the history of creation, certain life support systems of the planet are being destroyed by human actions. We have seen signs of the poor who struggle against poverty and oppression. The majority of the population know deeply degrading against human beings along with high levels of environment...degrading pollution.

Pollution of water, soil and air are greater than ever”.

It is true that most of the environmental degradation has been caused by man. But sometimes too natural disasters like earth quakes can also cause environmental degradation and spoil our lands.

According to an article published in Trinity Journal of Church and Theology Vol. X; Number 1 and 2 (W.B. Garbrah – n.d. : 69,70) states, “that sacred groves found in many parts of Ghana are a clear demonstration of the sense of ecology of the ancestors of not only the Akans but also of the other ethnic groups. These are important plant and animal gene banks. They are small forest reserves about two hectares in area, but there are others which are very much larger. Sometimes they look like castle with turrets because the surrounding areas have been cleared of all woody species through farming and other human activities and therefore are often only of primordial forest in the areas. The information provides us enough state of how some of our Forest have been exploited.

Again according to an article published in Trinity Journal of Church and Theology Vol. X: No 1 & 2 (W.B.Garbrah n.d.: 68) “ mother earth is a living goddess which needs periods of rest, and, therefore, weekly “Sabbath” are observed for the land, though the actual weekday may differ from place to place. This is Thursday among the Asante’s and Friday among the Fantes. For this reason, the land goddess is Asaase Yaa by the Asantes and Asaase Afua by the Fantes This weekly Sabbath obviously reduces the risk of over exploitation of the land, and additionally gives the farmer time to rest. In addition to the weekly Sabbath for the land, the Akans consider certain days to be particularly ominous and therefore the land should not be disturbed in any way on those days. Furthermore, the need for making traditional beliefs worthwhile but must be augmented with enough education as to why certain practices are allowed or prohibited. This will help in demystifying some superstitions which when exposed remove inhibitions and increase degradation. This information is relevant approach to the topic because it provides some basic laws that could be used to stop exploitation.

Garbrah further expressed that to converse sacred groves, farming, fishing, hunting, cutting or collection of fuel wood and sometimes even noise are prohibited in these woodlands. The spirits indwelling particular rocks, streams, trees or animals in the groves are often worshipped. For this reason, some of the groves have in them shrines where oracles and healings are sought.

Das (1996) writes, some ecologists or environmentalists argued for the protection of environment on the ground of ethics which is called environmental ethics. This concept can be viewed from different angles. As human beings have every right to

live, other animals or living objects have the same right and, therefore, human beings have no right to kill or destroy other species. To kill mercilessly is immoral and it must be stopped. The ecologists have forcefully argued this for the last several decades. In human societies it is an immoral act to kill an innocent man and, similarly, to kill animals or destroy other living objects falls in the category of immorality. Man must know it and since he overlooks it authority must see that human beings take all steps to protect the whole environment. There is another moral argument. It is observed that every generation has responsibility towards the next generation. It means each generation should keep a watch on the fact that resources of nature are well-protected so that the next generation can get the benefits from nature in order to ensure this it is the primary duty of each generation to use the environment judiciously. The failure to do this will be an immorality. One generation has no right to deprive the next generation of its legitimate privileges. Eco-conservatives think of protecting the environment. Ecosocialists hold the view that arrangements will be made in such a way that succeeding generations get the benefits of nature

Nash (1938) writes, “for the Christian churches, however, the ecological crisis is more than a biophysical challenge. It is also a theological-ethical challenge. The crisis is partly rooted in philosophical, theological and ethical convictions about the rights and powers of humankind in relation to the rest of the biophysical world. According to one popular conception – actually, a misconception and stereotype – of “dominion,” humankind is a distinctive creation designed for domination. We are a species segregated from nature and possessed with an ultimately sanctioned and unrestricted right to exploit the bountiful supply of nature’s “raw materials” provided

for human benefit. Nature is simply matter, resources waiting to be re-formed for human utility. This viewpoint embodies the fundamental failures at the roots of the ecological crisis: the failure to adapt to the limiting conditions (the carrying and recuperative capacities) of our earthly habitat, the failure to recognize the intricate and interdependent relationships involving humankind and the rest of the ecosphere, and the failure to respond benevolently and justly to the theological and biological fact of human kinship with all creations. Without doubt, Christian traditions bear some responsibility for propagating these failed perspectives. Consequently, the ecological crisis is a challenge to Christians to eradicate the last vestiges of these ecologically ruinous myths.

Schaeffer (1972) writes here is a remarkable combination of phrases being put together; the moral dissolved into the pragmatic. He starts off with a moral crisis but suddenly all one is left with is a pragmatic problem – “It involves the actual social consequences of a myriad of unconnected acts. The crisis comes by combining the results of a mistreatment of our environment. It involves the negligence of a small businessman on the Kalamazoo River, the irresponsibility of a large corporation on Lake Erie, the impatient use of land by Kentucky mine operators. Unfortunately, there is a long history of unnecessary and tragic destruction of animal and natural resources on the face of this continent.

Hendry (1980) stated that, it may be that the ecological concern, urgent and unavoidable as it is, runs some risk of aggravating the misuse of nature, if it is pursued on the assumption that the world of nature exists solely for the purpose of providing an oikos (oikos, meaning a house or habitat, is the root of the “eco” in

ecology) for human beings. This, of course, it is. But the question is whether this is all that it is. And this is a question which theology has to ask. We want to ask how nature is to be viewed from the perspective of a theological doctrine of the world as God's creation. It may be called a question of perception. We have seen in previous chapters that nature is perceived differently as it is viewed from different perspectives. It is the question of a theological perception of nature that this chapter will attempt to explore.

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Manjunath (2007), states that ideally the earth should have a forest cover of one-third of its land area, which should extend to sixty-six percent forest cover in the hilly regions. He laments on the rate at which forest cover of land is gradually reducing. He does a good work by sounding a caution that, “almost the entire block of developing countries and the poor countries of the Third World are situated in the tropical zone and that any disturbance to the forest in this zone has serious repercussions on the lives of the people and the environment”. Some of these serious repercussions on the lives of the local people have started to show up at Acherensua, in the area of low food productivity and the extinction of certain animal and tree species.

Mante (2004), said the root cause of ecological crisis in Africa is as a result of the influence of Western Theology and Philosophy that African Christianity has adopted over the years. He went on to say that most African Theologians have consciously or unconsciously inherited a certain kind of theological ontology (and hence, epistemology), which has decidedly shaped their theological, methodologies and which block them from seeing ecological issues as something of high importance in

their theological construction. He is of the view that African theologians had come out with African Christian Theology perhaps the ecological crisis in Africa today might have minimized. It appears true that before the Western Missionaries brought Christianity to Africa the African seem to have a sound theology of nature.

Asante (1994/5) said that “the issue of ecological crisis has become a matter of concern to people of all walks of life”. He notes that Environmental deterioration is a problem that humanity has created. Adarkwa Dadzie in her book *Nature Kicks Back* (2001) shares the same view with Asante. They both agree that environmental degradation is a problem that humanity has created.

James (1991) writes “the alleged ecological superiority of other religions and cultures over Christianity may be partly a manifestation of Western parochialism and historical myopia. The claim of the ecological complaint that Christianity should be abandoned in favour of another religion or fully infiltrated by the ecological values of another religion demands a response, particularly since so many contemporary Christian environmentalists seem sympathetic to infiltration. The response, however, must be a cautious one, in order to avoid the danger of succumbing to comparative religious or cross-cultural polemics (“My faith is better than your faith”). No one benefits from those diatribes. Nonetheless, some delicate apologies are in order as a witness for the defence.

1.9 ORGANIZATION OF THE STUDY

The study has six chapters, Chapter one, the introduction, definition of terms, statement of problem, objective of the study, significance of the study, limitation of

the study, problem envisage, methodology, area of the study, literature review and organization of the study. Chapter two examines human activities, environmental problems and human-nature relationship, Chapter three discusses degraded environment and vicious cycle of poverty. Chapter four looks at degraded environment and theological reflection. Chapter five examines climate change in Amansie West District. Chapter six analyses and interprets the field data and summarizes the issues emerging from the study.

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CHAPTER TWO

HUMAN ACTIVITIES AND DEGRADED ENVIRONMENT

2.1 INTRODUCTION

It is an undeniable fact that numerous human activities have degraded the environment. Degradation is a challenge to human survival and so the church cannot sit idle. The focus of this chapter is to examine the biophysical environment of Ghana and how human activities have impacted positively or negatively. In this chapter, a reflection on human nature, relationship, environmental concerns, and ecological orientation will be discussed.

2.2 BIOPHYSICAL ENVIRONMENT

Ghana has four (4) main ecological zones (Max Assimeng 1999: 35). These are the Southern Savannah, the forest, the transitional and the northern zones. Some scholars see the ecological zones as only three (that is coastal, forest and savannah). Laing (1991: 1) for example, holds that Ghana has two main identified vegetation types, namely the closed forest and savannah ecosystem. The fact of the matter is that some of the zones “overlap” with each other. This is particularly so with the northern parts of the Ashanti and Brong Ahafo, on one hand, and the southern parts of the Northern Region, on the other hand.

Laing (1991: 1) again observed that the closed forest covers at about 8.22 million hectares which is about 34.5% of the total land area and Savannah ecosystem is at about 15.6 million hectares covering about 65.5% of land covering two geographical

zones. One lying in a narrow coastal belt stretching from Accra widening towards Togo and other almost covers the northern two-thirds of the country.

The importance of the different zones is that they give rise to different patterns of economic activities as well as social organization. They also give rise to different forms of relationship between natural habitat, and the worldwide that are developed to ensure an understanding of the “universe” in which men and women find themselves. About two-thirds of the country’s population and most of the country’s economic activities are concentrated in the closed forest zones. Most of the original and natural vegetation is estimated to have been removed or at least, altered in one-way or the other. Generally Ghana’s ecology has been greatly impacted land degradation which is a major problem, as it is estimated that 35% of the total land area (83,489 km²) is subject to desertification as a result of the wanton destruction of the environment and removal of the vegetation cover.

2.3 HUMANKIND

The biophysical environment serves as the life support system to humankind. The biophysical entity that God created to support life signified by the State of Paradise in Genesis creation stories – land, water and air - before placing humankind in it to take care of it and to find life in it.

In the beginning, God saw nature as inherently good (Gen. 1:31) and it was in a perfect life-sustaining state before humankind settled in it. But humankind has encountered nature overtaxing it, ravaging it to the extent that “no longer can God proclaim that the creation is good, for humans have polluted it” (Simkins 1994:258) observes that “not only does the material world become a permanent menace through

pollution, new illness and unbridled power of destruction; the human ambience gives out of control creating for tomorrow an environment which may well be intolerable for humankind” (1999: 29). In the name of economic development, trade and commerce, mining and agriculture, Ghanaians have made much “withdrawals” from the environment, degrading the earth resulting in the disequilibrium in the ecosystem. It is a fact of nature that we cannot eat our cake and have it too, regarding our degraded environment. The laws of nature indicate that there is “no free lunch” elsewhere. For there is always a clear price for both nature and humanity to pay when we yearn for high-energy-use lifestyles that strain nature’s resources (McFague 2000: 40). Exploitation of nature’s resources has resulted in degradation of the environment.

2.4 ENVIRONMENTAL PROBLEMS

Ghana abounds in a variety of rich natural resources for her socio-economic development. Water, soil and vegetation cover are all natural resources which are vulnerable to depletion through overuse. The rich diversity of water resource, forest, and mineral resources play important roles in the developmental process of Ghana. Ghanaians have exploited the natural resources resulting in diverse environmental problems. For example, polluted air and water are dangerous to human life and other life forms. Ghana’s State of Environmental Report 2004 states that “the country has serious environmental problems”. These include land degradation, soil erosion, pollution of rivers, streams and lagoon, deforestation, desertification and waste management.

2.4.1 Land Management

Land management is a complex environmental problem. The improper management of land resources could result in social, political and environmental crisis. With increased extraction for the biophysical environment without replacing the resources; or replanting trees or re-engineering the physical environment; the environmental quality could be compromised. Poor land management has massive effects on soil quality and the quality of the land. Reduced vegetation cover leads to widespread erosion and reduced crop yields. Again, poor land management could increase the conditions for desertification towards the savannah areas of the country.

2.4.2 Pollution of Water Resources

Though water resources are quite abundant in Ghana, only a little over (30%) thirty percent of the total population has access to good drinking water, Green Fact (2005). The ineffective planning and management of water resource and the growing population are a major concern for Ghana. The disposal of domestic water, garbage, human excreta, agricultural wastes and industrial wastes into water bodies pose serious threat to the natural environment. Water pollution as a result of the discharge of all sorts of waste into water bodies from industrial mining areas where cyanide leaks pose danger to human and all aquatic lives. The EPA has identified agro-chemicals such as fertilizers, insecticides and herbicides on agricultural lands as major sources of pollution of water bodies.

2.4.3 Pollution of Marine and Coastal Water System

Ghana's coastal environment has also been greatly impacted. As the most densely populated region of the country, there is a concentration of urban and industrial

centres. About 60% of Ghana's industrial establishments are located in the Accra-Tema area and inadequate facilities of waste management, treatment and disposal are a major threat to this ecological zone. (EAP2,156)

While the marine and coastal ecosystems are not commonly associated with and suitable for arable agriculture, they remain the densely populated parts of the country and offer immense resources for tourism, fishery, industrial and mineral development. Yet they are continually being degraded. The EPA identifies two interferences leading to the degradation of Ghana's marine and coastal ecosystems, namely marine fisheries and coastal erosion and degradation.

Whilst fishing is by far the most common economic activity of marine and coastal human populations, fish stocks in the area under consideration stand the threat of depletion due to stress and pressure brought on the fish stocks from trade and international policies. Coastal erosion also poses a threat to the fragile coastal and marine ecosystems as a result of hydraulic action by ocean waves, which break and dislodge coastal sand and pebbles. Of recent concern spilling over from economic problems, is massive sand winning on the coasts causing erosion. The most well noted areas suffering from this malaise of coastal erosion are the Keta coast the Ada-Foah beach, the Labadi beach, the Nkontompo beach and the Axim shoreline.

2.4.4 Exploitation of Mineral Resources

In Ghana both underground and surface mining are practised. Both underground and surface mining have devastated the environment. The main problem characterized the underground mining are pollution of underground water source, noise and

vibration of the earth. The surface mining shows visible destruction of the land, soil degradation, deforestation and pollution of water bodies. Dust produced from mining activities also pollutes the air while water run-off from mining dams containing significant amount of sediments entering streams and rivers end up polluting waters.

One country in which the environmental impacts of small-scale gold-mining activities are becoming increasingly unmanageable is Ghana. Despite providing thousands of indigenous peoples with employment and making contributions to foreign exchange earnings, problems with mercury pollution and land degradation have intensified in many parts of the country within the industry in recent years. The government has been ineffective in its approach towards addressing these and related industrial environmental issues (Hilson Gavin 2002: 3).

The general environmental situation in Ghana is that of degradation of all kinds signify threats to socio-economic development and to the lives of both human and non human alike– the entire biotic community of Ghana as well as plans and policies formulated to police the natural environment.

2.4.5 Forest Resource and Deforestation

As indicated earlier, originally about 8.22 million hectares of Ghana is made up of the closed forest, which is about 34% of the total land area of Ghana. The Forestry department has records about 680 species of tree in the closed forest.

According to the EAP 2, the reserved forests are those that have been legally constituted under central government legislation namely the Forest Ordinance, to be permanently set aside and managed as forest reserves. The total of reserved forests is about 16.2% of the total land area and two thirds of these are located in the closed forests zone, with about 5.6% of reserved forests outside in the savannah zone. The unreserved forests are envisaged for conversion to other forms of land use but some of which it is now accepted, can be permanently managed concurrently with crop and animal production for the joint production of wood, energy, and other products. Majority of the existing unreserved forests are now scattered throughout the country in an unknown number of sacred groves – that is, forests preserved for cultural, religious or other reasons under custom; whilst most of the rest of the unreserved forests have been or are largely being cleared, cultivated or reduced to other forms of land use.

Ghana's forestry resources are closely linked to the economic and social development of the country. About two thirds of the country's human population, and most of the country's economic activities including timber, cocoa, and mineral production are concentrated in this zone. It has been estimated that in the 1980's timber was the third largest export commodity after cocoa and gold, accounting for about 5.7% of the total gross domestic product (GDP) of the country, whilst the forestry sector also employed some 70,000 people and Ghana's forests are also noted to be the provider of 75% of Ghana's energy requirements. In relation to the declining economic situation in Ghana and the extreme socio-economic hardships and problems that majority of the citizens have to live with, Asante notes that there has been the urgent need for a socio-economic transformation of the country and

given the structure of Ghana's economy, especially the prominence of farming as the means of livelihood for a fast-growing population, the role of forest as a sources of building materials, medicines, game, domestic fuel, etc, and the high dependence on the export of primary produce for external earnings, solving the problems of deforestation turns out to be a highly complex undertaking.

Generally, the forests of Ghana have been subjected to massive deforestation and degradation over the years as much of the original vegetation has been removed or considerably altered through conversion to various forms of land use. Whilst the figures vary, it is estimated that out of the estimated 8.22 million hectares of Ghana's closed forests only about 2 million hectares remain made up of about 1.7 hectares within the forest reserves and about 0.3 – 0.5 million hectares outside the legally constituted reserves forests remain. A report by Friends of the Earth (FoE), Cut and Run, cites sources indicating that more than 90% of Ghana's forests have been logged since the 1940's and that out of the 8.22 million hectares, the forests have been drastically reduced to about 1.7 million hectares. The EAP 2 indicates, however, that the current data as of 1994 recorded from the World's Resource Institute (WRI, 1987) shows an annual deforestation rate of 22,000 hectares, between the periods 1981 – 1985, which is about 1.3% and this has been corroborated by the FoE Report.

Ghana's forest resources are fast diminishing and this poses an unprecedented threat to the socio-economic growth of the country as well, as the forests may entirely disappear if their management and protection is not drastically stepped up. For instance, the cost borne by Ghana as a result of the loss of forests through fire,

logging, wood-fuel extraction, charcoaling and agricultural encroachment as of 1991 (time of publication of the EAP 1 document) was about 10.8 billion cedis per year. In the closed forest zone deforestation is said to be serious around the larger areas of human population where, in some instances, the village communities already face a problem of wood-fuel.

The causes of deforestation in Ghana are diverse and underpinned by a myriad of complex and interlinked factors with historical, social, political, international and economic dimensions. Basically deforestation results from the conversion of hundreds and thousands of hectares of forest to other forms of land use such as the growing of crops, mining activities, road construction, citing of settlements and industries. The EPA of Ghana identifies four main anthropogenic causes of deforestation in Ghana. The four main causes of deforestation identified by the EPA are:

- a. The clearing of forested lands for agriculture, and the shortening of the fallow periods resulting from increased population with consequent disease in available land, leading to a gradual elimination of tree cover.
- b. Excessive browsing on seedlings and ligneous vegetation by grazing animals
- c. The use of fire for clearing, consuming seed in the soil, killing regenerating seedlings, and tending to eliminate trees from the landscape.
- d. The cutting of trees and shrubs for wood-fuel, especially where wood-fuel becomes commercialized and the trees affected by bushfires, wildfires and, in the extreme, living trees not recently affected by fire are cut for sale.

Another factor identified by the EPA, but which is noted to contribute to forest degradation rather than deforestation is logging. Logging leads to forest degradation by opening up new areas to settlement, and may also contribute to increased deforestation. Generally, the causes of deforestation to date are the conversion of forests to other land uses, particularly agriculture, whereas bushfires, logging and wood-fuel, both for industrial and commercial uses exert their toll on the forests of Ghana.

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2.5 ENVIRONMENTAL CRISIS

The introduction of unacceptable substances and matter in quantities is too great for nature to bear into the physical environment resulting in the reduction of the quality of environment which constitutes an environmental crisis. This is so because they cause health hazards to plants, animals and human beings. Hence, pollution is an environmental crisis. When natural resources are depleted at a faster rate without any replacement, there will be environmental disequilibrium and crisis will certainly occur. Again when plants and animals are lost without replacement there will be lost of biodiversity, to keep the ecosystem. That will constitute an environmental crisis. Environmental crisis will always be with us as long as humanity demands on natural resources outstrip nature's capacity to regenerate on its own time cycles and terms which forces serious change in the natural systems themselves.

2.5.1 Agricultural Lands

Human activities have impacted negatively on agricultural lands. Agricultural lands in many places are gradually becoming degraded, mainly as a consequence of poor agricultural practices, poor irrigation practices, insufficient crop rotation and fallow

periods. Wind and water erosion reduce the fertility, stability, and therefore the productivity of soils. Each year Ghana loses unestimated million tons of top soil from agricultural lands in excess of new soil formation. It is a fact in nature that it takes to rebuild an inch of lost top soil. This phenomenon could affect food production to feed the growing population of Ghana

2.5.2 Sand Winning

Sand winning in most part of Ghana has become a source of worry to Ghanaians. Apart from top soil scrapped off, the plant species and other animals are destroyed. Sand winning destroys the habitats of most plant and animal species. Serious sand winning greatly affects the landscape of most communities in Ghana.

2.6 ENVIRONMENTAL ORIENTATION

It is very important to change our mentality towards nature. We need to draw humankind attention to the fact that God created everything for a purpose. The book of proverbs affirms this statement “The Lord has made everything for its purpose, even the wicked for the day of trouble” (Prov. 16:4. RSV). Supporting this, Richard A. Young has this to say, “Everything was designed and made by God and for God to fulfil a variety of purposes. (1944).

Deducing from these two statements, we need to understand that if we were created for a purpose, we need not to do anything that may turn to degrade the environment which may in turn create environmental or ecological crisis. The change in attitude towards the environment will bring solution to the problem. If we don't change our attitude and mentality towards nature, we will continue to die in this mess.

Environmental orientation is a philosophical orientation that requires that the existence of an entity should be received in terms of symbolic relationship with its environment. The issue of environment should be factored into our daily behaviours and actions.

2.7 HUMAN – NATURE RELATIONSHIP

Young (1994: 65) writes that scriptures depict human as living in tension. That humans are both part of nature and separate from it; both immanent and transcendent. One aspect of this polarity cannot be stressed over the other without resulting in unbalance view of our place in the cosmos and our responsibility for the environment.

Young (1994) further stresses that if humanity's transcendence is stressed, the result tends towards humanistic anthropocentrism. On the other hand, if humanity's immanent is stressed, the results tend towards pantheistic biocentrism. But with either option, human responsibility before God for taking care of the environment is weakened. The first promotes arrogant autonomy with the belief that we have the right to exploit nature for our own ends. The second encourages a flattened hierarchical system that negates conflict resolution and environmental imperatives. The first looks to humanity for direction, the second to nature; neither looks to God as the source of value and meaning.

2.8 CONCLUSION

Human activities have impacted negatively on the environment. Human activities have impacted negatively on agriculture, agricultural lands in many places are

gradually becoming degraded, mainly as a consequence of poor agricultural practices. It was realised that the forests of Ghana have been subjected to massive deforestation and degradation over the years as much of the original vegetation has been removed. The researcher also found that, Ghana's forest resources are fast diminishing and this poses an unprecedented threat to the socio-economic growth of the country.

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CHAPTER THREE

DEGRADED ENVIRONMENT AND VICIOUS CYCLE OF POVERTY

3.1 INTRODUCTION

This chapter would look at degraded environment which calls for scarce resources leading to poverty, population growth and earth finite resources, depletion of earth resources, pollution and destruction of the environment, illegal mining, poverty and degraded environment and lack of portable water and food.

The researcher started the discussion on the relationship between the degradation of the environment and poverty from an abstract from Obeng. He writes; the extreme poverty poses a threat to ecology in Africa. In the rural areas, farmers because of the squeeze on land, are cutting on fallow periods, hence there is overuse of available land so the soil is exhausted and yields fall. He went on to say that the use of fertilizers could compensate for this but the imputes are expensive and thus beyond the means of the poor farmers. The fallow periods are insufficient for trees to re-establish themselves and this leads to soil erosion. The poor in the rural areas are often forced to cut down trees for fuel. Although this is a poor source of fuel, the poor have no alternative. Paraffin and Kerosene are expensive. The poor cannot afford the equipment to burn it. Because they cannot afford these, they cut down trees thus worsening deforestation and encouraging erosion.

Obeng looked at it from a narrow view but on a broader sense, the activities that the people perform to get their daily bread and to be able to sustain go beyond the activities they perform. The researcher is saying this because, in the attempt to work

for food, shelter, development, building of schools and roads, the environment is one way or another destroyed or exploited before they get all these things done.

In this case the researcher want to make it clear that poverty is a source of ecological degradation and working together to alleviate it is an ecological concern. The people don't have any alternative sources of food and basic needs like food, they too will wantonly destroy whatever natural environment is around them. Even though we don't have any alternate source of livelihood except through the old way or methods we used to go about in dealing with nature, humankind should be blamed in the state of poverty that we find ourselves.

The resources available to meet the growing need of the people are scarce and continuous pressing on the little creates more problems for the people are depriving them and making them more poor because the resources are scarce.

Mathew Theuri highlights the moral and theological dimensions of poverty – its nature, intensity and magnitude, and more so as it relates to Africa. He also recognizes that the gap between the rich and the poor widens every day. He further questions as to whether there is a relationship between poverty and religion. He urges the divine mandate to participate in-solving it. The Church, he suggested, must strive to preach the gospel to the poor, as preached by Jesus Christ. Poverty is thus, a theological issue and concern.

With environmental degradation comes increasing scarcity, and that is likely to become more acute as time goes on so poverty outcomes are likely to increase in the future.

3.2 POVERTY

According to IPI blue papers on under development, resource, scarcity and environmental degradation in the past 30 years, there has been enormous progress in the fight against poverty. While the number of people living in extreme poverty worldwide stood at a daunting 1.4 billion in 2005, this still represents a marked decrease from 25 years earlier. From 1981 to 2005, the world witnessed a halving of the percentage of people in the developing world living in the extreme poverty from 52% to 25%. Taking into consideration the global population increase during this period, this amounts to a 21% reduction in the global poverty rate. An increase in the economic opportunities and regular access to a basic service such as water, medical care reduction has resulted in the remarkable improvements in the global living standards.

The paper went on to say that the global decrease in extreme poverty reflects notable progress in East Asia and the Pacific, where the \$1.25/day poverty rate decline from 28% to 17% between 1981 and 2005; the same estimate as in 1981. In fact, while the number of people living on less than \$1.25/day globally has decreased, the number of people living on more than \$1.25 but less than \$2/day has increased dramatically – from 600 million to 1.2 billion.

While poverty was higher in rural, less-densely-populated areas, it is now clearly present in urban centres and sprawls too. In fact, poverty has been growing faster in urban areas than in rural areas over the past 15 to 20 years. In slums and in the peripheries of growing cities, the delivery of basic services and the opportunity for promising economic and political prospect is often lacking. According to Ghana

Poverty Reduction Strategy (GPRS), four of every ten Ghanaian still lives in poverty. Many of them work in agriculture mostly food crop farmers. Again an IFAD special mission report estimate that the population of rural poor increase from 43% in 1970 to 54% in 1986. Rough estimates provided by Green (1988) also showed that the number of urban people below the poverty line increased from averaged of between 30% and 35% in the late 70s to the range of 45%-50% in the mid 1980s. According to Ghana Living Standard Surveys, 1987-1992 poverty levels in Accra increased substantially between 1987 and 1992. Rural-Savanna was the poorest zone in the country with more than a third being very poor in 1992. In spite of the increases in poverty levels in Accra, it still remains the locality with the least poor; although it is gradually declining to the national average.

Addo Obeng looked at it from a broader sense in his journal “The Groaning Situation in Africa” that in Africa, there is a clear example of vicious cycle of poverty and deteriorating ecosystem. According to him, poverty is a source of environmental problems like deforestation whilst a deteriorating ecosystem affects the poor and increases their poverty. He added further that the groaning situation can be deduced from those problems which contribute to poverty in Africa and which in turn create environmental problems on the continent. He went on to state some factors that have contributed to the above problems. He looked at it from two main factors, natural factors and human activities. Some of his ideas are discussed below.

One of the problems with Africa is that most of the continent lies within the tropical whether which is never moderate, always extreme. According to him, there is either too much or too little rain. During the wet season, rain is excessive and its force

leaches out valuable minerals and nutrients from the soil. Besides the first heavy drops in a heavy downpour clog the pores of the soil with fine particles washed from the surface. After few minutes the soil cannot absorb more than a small fraction of the rainfall to facilitate the growth of crops. He further stated that though many African countries appear to receive what seems to be adequate rainfall, they get it all within short durations, and most of it is wasted- because it runs off in rivulets which cause severe erosion. In many African countries, the problem is that of torrential downpours of only a few months interspersed with long periods of very little rain.

There is also too much heat which creates incubator effects on biological activity, leading to another hazard, the flourishing of life forms hostile to humankind- diseases-carrying mosquitoes, tsetse flies, black flies, sand flies and so on. There are also different forms of parasite, microbes and fungi attacking and debilitating and killing Africans, wilting and blighting plants, eating crops alive in the fields or destroying the yields in the granaries and store rooms.

According to Obeng, the excessive heat also affects tropical plants. They transpire more moisture than they should. Heat also directly affects the productivity of the African worker since it drains him or her of the vitality. These geographical facts according to Obeng are primary causes of poverty in the continent.

The situation in Ghana is similar and it is also true because we find Ghana in Africa and she shares the same geographical and climatical situations or problems. Sometimes, you can't solely blame the state of poverty on the people but sometimes the weather which cannot be determined by these poor people. According to

International Labour Office, four of every ten Ghanaians still live in poverty. Many of them work in Agriculture, mostly as food crop farmers, others are engaged in micro and small enterprises or finding a survival income as daily casual labour. Today, two thirds of the working population outside agriculture is in active in the informal economy. The paper continue to explain that many are persistently poor, particularly women. The government of Ghana realizes that there are no alternatives to gainful employment for a livelihood. What people need to move out of poverty is a decent job. I don't seem to agree with the writer on this stage because the issue is not solely on job issues but the type of job that will not further compound their situation of degrading the environment with the scarce resource that we have.

3.3 RESOURCE SCARCITY

Resource scarcity is another challenging issue which compounds poverty in Ghana, as well as to human security at large. The rapid increase in Ghana's population and acceleration of economic activity has increased the demand for both renewable and finite natural resources. Unsustainable resource use has serious consequences for the environment which in turn has implications for human development outcomes for health, education, diseases and sometimes death.

Over the past few weeks, there have been reports about mining pits collapsing on illegal miners resulting in the death of many leaving their family in very poor conditions. A recent report carried by Social Support Foundation, indicated that five people consisting of four women and a man lost their lives when an abandoned illegal mining pit collapsed on miners in the Mpohor Wassa East District of the Western Region of Ghana.

Most of the lands which could be used to develop the areas are destroyed. Small scale illegal mining activities do not only threaten the lives of operators but also non-operators. Members in these mostly farming communities where the illegal mining activities take place are to a large extent left to deal with floods and the pollution of water bodies resulting from galamsey operation. As an environmentalist, galamsey activities are a contributing factor to the destruction of the environment. I am saying this because the digging of the earth crust poses danger to the livelihood of other inhabitants in the mining communities, as their lands, which they mostly use for farming are rendered infertile due to the chemicals in the explosives illegal miners use.

Giving more clarification on the level of damage caused by the galamsey operators, a news item carried by an Accra-based radio station notes that environmentalists attributed recent flooding in the parts of the Eastern Region, affecting almost four communities to galamsey operations. The report indicates that a diversion of the Birim River by galamsey operators for the washing activity caused the towns to flood. (<http://www.dailygraphicghana.com/wp-content/uploads/2011/11/obuasi-galamsey.jpg>)

Adding further stress, environmental challenges such as climate change exacerbate come forms of resource scarcity, such as water scarcity. Economic growth is key to development and poverty reduction. Resource scarcity affects this in two ways; it increases the number of people in poverty, and it reduces the availability of imputes (water, energy, land etc) needed for development.

3.4 WATER SCARCITY

The fast growth of economic development coupled with environmental degradation and population has put pressure on fresh water resources.

Borrcce (1973) in his book “Population, Environment and Society” said that population problem is much with us today. The idea of developing the country is very good but in our attempt of doing that we turn to destroy the environment. Groundwater which provides water for domestic use has put pressure on water use. Groundwater levels in densely populated areas like Accra and Kumasi for instance, have been declining rapidly because of overuse. Inefficient use and mismanagement of water resources also waste enormous volumes of water in rural and urban areas. Social Support Foundation is also of the view that threat of water scarcity is not limited to physical scarcity due to depletion from farming and human consumption but also refers to scarcity of uncontaminated water suitable for human use.

The situation is serious as depicted in this extract from a conference head by GSA in its 10th Biennial Workshop in July 2006 on the theme “Rainwater Harvesting: A Sustainable Solution to Water Shortage”

... Ghana have been confronted with cute water shortage problems for a long time. Many people in several parts of the country still rely on open streams, rivers, lakes, pools dugouts and impoundment reservoirs for their domestic water needs. Persistent water shortages are part of life even in urban areas. During acute periods, workers scramble for water for long hours before going to work, resulting in the loss of significant and

productive man-hours, school children also waste precious study hours looking for water.

3.5 LAND SCARCITY

Poverty in Ghana is more rampant in rural populations that depend on the land. The same land is almost used every year putting pressure on the land for their survival. The researcher went to his hometown recently, after some years of having been away from that place. The researcher was shocked with what he found. All the previous farmlands that were lying within approximately two miles radius from the outskirts of it had all become part of the town. As a result of that all the people who previously farmed on these lands have become “farm less” and without any realistic means of livelihood. This development has created mass unemployment and poverty in the town a place that previously was farming area and a breadbasket for the local community in that part serving Mampong and other areas in Sekyere District.

According to FAO report on land, land and water resources for food and Agriculture (SOLAW); widespread degradation and deepening scarcity of land and water resources have placed a number of key food production systems around the globe risky, posing a profound challenge to the task of feeding a world population expected to reach nine billion people by 2050.

The report went on to say that there is an increased competition for land and water, as the report says it has become “pervasive”. It said this includes competition between urban and industrial users as well as within the agricultural sector- between livestock, staple crops, non-food crops, and biofuel production.

Overall, the report paints the picture of a world experiencing imbalance between the availability and demand for land and water resources at the local and national levels. The report made a serious statement which is very important that “worldwide, the poorest have the least access to land and water and are locked in a poverty trap of small farms with poor quality soils and high vulnerability to land degradation and climatic uncertainty”.

3.6 POPULATION GROWTH AND EARTH FINITE RESOURCES

The issue of overpopulation is the overriding environmental issue of our time. As population increases, more stress is put on the earth's finite resources. As people endeavour to raise their standards of living, even more stress is put on Earth to be able to work perfectly, it is important to understand population dynamics to help us understand our environmental problems and possible solutions. Generally, increased population results in more pollution, depletion of natural resources, crowding, stress, and other undesirable development.

3.6.1 Population Growth in Ghana

As is the case in many African countries, the present high level of Ghana's population growth results from persistent high birth rates and declining mortality rates over the years. Consequently, the rate of increase of the population has been high about 3.1% per year. At this rate, Ghana's population will double in 25 years compared to a country like the United Kingdom's rate of 0.2 which will take about 267 years to double her population. (Population Data Sheet)

3.6.2 Fertility

Various estimates of the level of fertility obtained from census and surveys indicate that the level of fertility in Ghana has remained at a very high level over a year.

3.6.3 Population Growth Outripping the Earth's Finite Resources

According to Addo Obeng, the situation is very serious as is depicted in the extract he picked from a communiqué issue by the world Council of Churches Consultation at Baixada Flumimes, Brazil in 1992

...the earth is in peril. Our only home is plain jeopardy.

We are at the precipice of self-destruction. For the very first time in the history of creation, certain life support systems of the planet are being destroyed by human actions. We have seen signs of the poor who struggle against poverty and oppression. The majority of the population ... know deeply degrading conditions of life. Poverty and violence are overwhelming against human beings, along with high levels of environment degrading population ... Pollution of water, soil and air are greater than over ...

When you look at the above picture clearly, you see or feel that the increase in population and the poverty rate or high poverty is forcing people to destroy the environment. At the same time, people have not stopped producing children or giving birth to children.

Adding his voice to the debate, Nash said that the biblical injunction to “increase and multiply” may be the only one that humankind has obeyed faithfully. According to

him, the world's human population as at this writing roughly 5.3 billion and growing. Current projections indicate that the figure probably will rise to 10 to 11 billion by 2025, and may reach 14 billion by 2100, when some – not all – predict it will stabilize.

According to Nash, the growth is not descriptively an explosion but it is certainly a dramatic – and seemingly a dangerous – progression.

According to World Bank Statistics, one in five of the world's population (two-thirds) of them women live in abject poverty without adequate food, clean water, sanitation or healthcare, and without education. One third of all humankind is surviving on less than US\$ 1/day (UIC Government White Paper 2000). South Asia has the largest number of poor people (525 million or 40% of the population).

3.6.4 Effects of Over Population

Overpopulation is a generally undesirable condition where an organism's numbers exceed the carrying capacity of its habitat. The term often refers to the relationship between the human population and its environment, the Earth's overpopulation can result from many reasons and one of them is from an unsustainable biome and depletion of the resources.

According to James A. Nash one current consequence is that many poor nations are losing the race between socioeconomic well-being and population expansion. According to him, they are like runners on a conveyor belt moving in the opposite direction; they must run in the same place or make slight progress. He further stated that their dilemma of development can be stated simply in a real – not hypothetical –

scenario; if a country's productivity increases by 2% and its population rises by 3% then its per capital income declines by 1%. According to him this formula does not include the problem of misdistribution. Hence some poor nations are achieving net decreases or insufficient increase in their standards of living, partly because their industrial and agricultural productivity is erased by expanding numbers. The case is not different in Ghana. In Ghana the population has been growing continuously for some time now. Currently the total population of Ghana stands about 24 million posing a lot of pressure on the inadequate existence resources in the country and it is causing a lot of concern. The Inter Academy Panel Statement on the Population Growth has stated that many environmental problems, such as rising levels of atmospheric carbon dioxide, global warming and pollution are aggravated by the population expansion. In Ghana the major problem associated with population growth include the increased demand for resources such as fresh water and food. Most of our major rivers are been polluted by galamsey and mining companies leaving our rivers and streams not drinkable.

David Pimentel a Professor of Cornell University, has stated that “with the imbalance growing between population numbers and life sustaining resources, human must actively conserve cropland, fresh water, energy and biological resources. According to him, there is the need to develop renewable energy resources. Humans everywhere must understand that rapid population growth damages the earth's resources and diminishes human well-being.

Population growth exacerbates the problem of improving education cultural creativity, employment, healthcare, sanitation, housing and available food.

According to 2004 study by Zhoua and Tolb, these problems are especially acute in the emerging megacities of the Third World, which are experiencing what used to be called the population implosion. They quoted Malthusian theory that population, growing geometrically, will outstrip the means of substance is actually or potentially a gruesome reality in some regions of the planet.

The third problem associated with population growth according to UN Human Development Report of 1997 states that excessive population growth accentuates every environmental problem. The ecological reality is that the earth has limited resources to sustain and improve the quality of life. According to the report earth has a carrying capacity, and population growth can exceed that capacity as it has done often in densely populated places. The report further stated that increased demand for sufficient nutrition and other basic needs can lead to excessive exploitation of nature's resources.

Similarly, although the proportion of "starving" of people in Ghana has decreased, the absolute number of starving people has increased due to population growth. According to statistics, the percentage dropped from 38% in 1970 to 33% in 1996 and was expected to be 30% by 2010. Another cause of resource exploitation stems from the expansion of consumption of energy resources; increased population, the accelerated destruction of forest and other ecosystems and their inhabitants. This is very common in the Afram plains in town like Kete Krachie.

3.6.5 Depletion of Earth Resources

Resource depletion is a term used to describe the resources in a country or area being used up and has no more of the current resources. Resources Depletion includes the depletion of resources, such as trees, oil, fish, fossils fuels etc.

According to Save the Earth Team 2007-2008, there are two (2) kinds of resources, non-renewable and renewable resources. Renewable resources such as wind, solar energy are everlasting but are generally more expensive than non-renewable resources. According to the team, non-renewable resources cannot be reused after being used for the first time, while renewable resources can be reused even after being used for the time. After careful observation and a wide reading on environmental degradation, resources depletion may be due to the “overpopulation” or the high rate of population increase in Ghana, that there are too little resources.

In October 2007, the United Nations Environment Program published Global Environment Outlook. Environment for Development a comprehensive report prepared by 360 scientists, and reviewed by over 1,000 others around the world. The report highlights a number of areas in which the environment is being depleted or damaged.

- (i) On the growing human population, the report states “the amount of resources needed to sustain it exceeds what is available humanity’s footprint (its environmental demand) is 21.9 hectares per person while the Earth’s biological capacity is on average only 15.7”.
- (ii) It highlights the fact that the globalization and the environment are intrinsically linked with the growth in the world trade facilitating the spread

of exotic species while encouraging the preponderance cash producing crops such as wheat, corn, soya and rice.

- (iii) It shows that current biodiversity changes are the fastest in human history, with 30% of amphibians, 12% of birds and 23% of mammals now under threat of extinction.
- (iv) It predicts that water scarcity will increase in the future, with developing and developed countries needing a 50% and 18% increase respectively by 2025. It goes on to say that water quality is declining even in the developed world, with contaminated water being the single greatest cause of human disease and death.
- (v) From my opinion, these reports clearly indicate that the world's environmental resources are being depleted. It is also clear from the above that increasing levels of carbon dioxide, population growth, pollution and the intensive use of energy are all putting an intolerable strain on the environment. We should know that the earth cannot live beyond its environmental means indefinitely. Despite all the attention being paid to climate change and environmental issues, the planet's ecology, biodiversity, atmosphere and water systems are continuing to suffer and degrade. Further reading and research seem to suggest that humankind's restless drive for economic growth and the growing demand for energy are having a damaging affect on many aspects of the environment.
- (vi) We should also know that trees don't pollute as well as animals but they perform essential ecosystemic functions like recycling. However, humans do pollute in a variety of ways that exceed popular understandings.

The subsequent paragraph will look at some of the different types of resource depletion.

3.6.6 Oil

According to James P. Leape, director of World Wildlife Fund (WWF) oil is actually fossil fuel, natural gas, coal, etc. It is burnt in power plants to produce steam so as to turn the turbines to give to power produce electricity. In actual fact it makes even more pollution. I heard a debate on a television that the effects of climate change will be a bigger concern than oil depletion while others say that without oil, it would be harder to combat climate change.

The effects of oil depletion are being felt now (as of 4th January, 2008) the prices of oil have recently rose to the extent that it has reached close to US\$100 per barrel. The people in Ghana have started feeling that the price has gone up. According to Mathew Simmons, the world is using 28 billion barrels per year. He further stated that if this continues, the oil reserves will run out very fast and I agreed with him that if nothing is done about it, it will eventually become a global problem as everyone would be thinking about alternatives to oil.

3.6.7 Trees Depletion

Trees play an important role in our life. They provide us with a lot of things such as paper, oxygen etc. In short, they are very important to our survival on earth. The rate at which Ghanaians cut down trees for various reasons of both natural restoration or managed reforestation is alarming. According to statistics, we are cutting trees so fast that we are actually cutting 12 million hectares of forest every year. If there are no steps taken to stop this action soon, we will lose almost all our

forests in the world. Critical observation shows that we are doing excessive deforestation, which means that we cut down more trees than we plant them which will eventually mean running out trees which will affect our future living conditions.

3.6.8 Animals Depletion

Hunting animals for their meat or certain parts of their body has been carried out for hundreds of years, since humans were just cave people. Instead of killing and hunting these animals, why not conserve them. If we continue this rate of hunting we may not only upset the balance in the ecosystem, but also may make a species extinct like in the case of the dodo bird.

3.6.9 Water Depletion

According to Save the Earth Team 2007-2008, the Earth is about 70% covered by water, however, out of that 70% only about 3% of it is consumable water. The present distributions of this consumable water are 70% agriculture, 25% for industrial purposes and 10% for personal use.

Basically, the causes for water depletion had been overpopulation. With the population of the world still growing the current supply of consumable water will soon not be enough to meet the world demands. Unless we can find an alternative water source, we will soon face a major problem.

3.6.10 Soil Depletion

For as long as we can remember, agriculture is very important part of our survival. It provides us a source of income, and also a source of food. Lately however, due to

our growing population, we have been using up the soil's minerals at a very alarming rate. Some areas are even experiencing low nutrient content in the soil.

This would eventually lead to poor quality of crops growing there soon; we may experience a shortage of food. Usually, the soil would replenish its nutrient content naturally. However, the process takes quite a while; Ghanaians are using the nutrients of the soil faster than it can replenish itself. In areas where there was once fertile land like Afram Plains and Adanse, now it is just a piece of barren land. It was once a place where many crops could grow, the soil was full of nutrients, but now much of it is a desert.

3.7 POLLUTION AND DESTRUCTION OF THE ENVIRONMENT

Environmental pollution and environmental destruction must be seen in close proximity or are inter related. For our survival, each society derives its resources from the environment. According to James A. Nash on *Loving Nature*, pollution can be defined as the harmful or fatal effects of human actions, direct or indirect, that place natural and or synthetic elements in ecosystem where they should not be at all or in amounts that surpass ecosystem capacities for normal assimilation. He added an interesting aspect that "trees don't pollute, contrary to a former president but they perform essential ecosystem functions like recycling. To him, humans do pollute in a variety of ways that exceed popular understanding. Pollution, therefore, is a generic term to cover a multitude of overlapping sins. In our subsequent discussions, it is very important to look at the types of environmental pollutants.

3.7.1 Types of Environmental Pollution

Human activity is characterized by a huge diversity and practically in every field pollution may be generated. It starts from the rural areas and moves to the urban centres across Ghana. At first pollution in our villages were small or was not high, but now due to expansion of constructions of houses as a result of population increase, pollution has also increased. Pollution can be divided in terms of environmental or the area of contamination, air pollution, soil pollution, water pollution and landscape pollution.

3.7.1.1 Air Pollution

Anthropogenic air pollution is mainly the result of the emission of harmful dust, gases and aerosols into the atmosphere. These harmful substances come from industrial, food processing and transport activity. The case is not different in Ghana. The reason been that most of the cars imported into the country are old enough which generate a lot of smoke into the atmosphere which pollute the environment. And such cars are very common in Ghana. In other words Air pollution is the introduction of chemicals, particular matter, or biological materials that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment or build environment into the atmosphere.

According to AP 42 Compilation of Air Pollutant, there are two main sources of air pollution. The first one is “stationery source” which include smoke, stacks of power plants, manufacturing facilities (factories) and waste incinerators, as well as furnaces and other types of fuel – burning heating devices. In developing and poor countries, traditional biomass burning is the major source of air pollutants; traditional biomass

includes wood, crop waste and dung. The second source according to AP 42 Compilation of Air Pollution is Natural Sources, Methane, emitted by the digestion of food by animals, for example, cattle.

3.7.1.2 Water Pollution

According to Charlse D. Koven, water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans, aquifers and groundwater). Water pollution occurs when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds. Water pollution is the effect of water contamination by sewage and waste. Additional factors which pollute are; water transport (direct influence) and using pesticide and chemical fertilizers in agriculture: these agents penetrate through soil into cycle. What is more, the cycle of water in the nature is disturbed due to forest destruction, improper farming, and development of cities.

Daniel Pennise explains that water pollution occurs when the water becomes overlooked with too much of one thing and the aquatic organisms cannot keep up with their cleaning responsibilities. According to him, there are several major types of water pollution. One of the most destructive type is Petroleum Pollution. Petroleum products such as oil and gasoline enter the water from ships and marine terminals, offshore oil rigs, run off from parking lots, factories, oil dumping and other sources. He added that many of the worst pollution disasters have been due to accidents involving oil rigs, pipelines, or oil tankers. On sewage pollution, he explained that it comes from both urban (city) and rural (country) areas.

3.7.1.3 Land Pollution

According to <http://answers.ask.com> land pollution is when the land gets polluted by waste or garbage. Land pollution can also be caused by misusing our natural resources like cutting down trees. Land pollution is also the degradation of the earth's land through human misuse of the soil. Human influences such as poor agricultural practices, the digging up of important resources, industrial waste dumping, and careless disposal of trash continue to pollute the land rapidly. Human impact on the land place an important role in the cleanliness and prosperity of our earth's future.

Land pollution also includes first of all, omnipresent rubbish, waste stockpiles, dumps, slag heaps and damage caused by the exploitation of fossil deposits, everything that lowers the aesthetic qualities of the environment and frequently results in the destruction of the nearby ecosystems. The Daily Graphic on Monday July 16, 2012 reported that “a recent visit by Association of Environmental Journalists (ASEJ) revealed that Chinese nationals are destroying large areas of fertile lands which are used for farming in some communities at Amansie Central, Amansie West, the Obuasi Municipality all in the Ashanti Region where galamsey operations drive. The paper made reference to June 25, 2012 issue of the Daily Graphic, Mr Mahama was reported to have expressed concern about the activities of foreign nationals who use “sophisticated machines, including excavators and bulldozers to destroy the environment”.

3.8 ILLEGAL MINING AND POVERTY

Small-scale mining in Ghana is defined to include both the exploitation of mineral deposits using fairly rudimentary implements and at low levels of production with minimal capital investment. While the large-scale mining—of particularly gold—has become predominant, small-scale mining, which predates such operations, has continued to be an important economic activity, particularly within the remote and poorer areas of the country. My area of work, Amansie West consisting of Manso Konyinase, Dataano and others are not of exception. The environmental impacts of such small operations have, however, varied, depending on methods and the scale of operation. The factors that have contributed to aggravating these environmental impacts are economic, technical, legal, and operational in nature.

3.8.1 Definitions, Processes and Methods of Mining

Mining is the removal of minerals from the earth's crust in the service of man (Down and Stock, 1977 cited in Acheampong, 2004:1). The Encarta encyclopaedia also defines mining as the selective recovery of minerals and materials, other than recently formed organic materials from the crust of the earth (Encarta, 2005). Mining has also been defined as the extraction of valuable minerals or other geological materials from the earth, usually (but not always) from an ore body, vein, or (coal) seam. Materials recovered by mining include bauxite, coal, diamonds, iron, precious metals, lead, limestone, nickel, phosphate, rock salt, tin, uranium, and molybdenum. Any material that cannot be grown from agricultural processes must be mined. Mining in a wider sense can also include extraction of petroleum, natural gas, and even water (Wikipedia, 2006).

The oldest known mine in the archaeological record is the "Lion Cave" in Swaziland. Available literature indicates that basically, there are eight steps to mining process. These are as follows:

- i. Prospecting to locate ore.
- ii. Exploration to defining the extent and value of ore where it was located.
- iii. Conduct resource estimate to mathematically estimate the extent and grade of the deposit.
- iv. Conduct mine planning to evaluate the economically recoverable portion of the deposit.
- v. Conduct a feasibility study to evaluate the total project and make a decision as whether to develop or walk away from a proposed mine project. This includes a cradle to grave analysis of the possible mine, from the initial excavation all the way through to reclamation.
- vi. Development to create access to an ore body.
- vii. Exploitation to extract ore on a large scale.
- viii. Reclamation to make land where a mine had been suitable for future use (Wikipedia, 2006). Mining methods are of four basic types. Firstly, materials may be mined from surface mines, open pits, quarries, or other diggings open to the atmosphere. This group constitutes by far the greatest number of mines in the world. Secondly, there are underground mines, entered through shafts or tunnels. Thirdly, there is the recovery of minerals and fuels through boreholes. Finally, there is underwater mining or dredging, which is now extending to the potential mining of the deep oceans (Encarta, 2005).

3.8.2 Mining and Economic Development

The contributions of mining to economic development are immense. Mining has an essential foundation for human development through creation of wealth (Acheampong, 2004). The mining industry has been key to the development of civilisation, underpinning the iron and bronze ages, the industrial revolution and the infrastructure of today's information age. In 2001, the mining industry produced over 6 billion tons of raw product valued at several trillion dollars (Mbendi, 2004). Traditional mining countries such as the USA, Canada, Australia, South Africa and Chile dominate the global mining scene. These countries have become the traditional leaders in mining and exploration methods and technology (Mbendi, 2004). The contributions of the mining sector for some selected countries can be evaluated. The mining industry in Peru accounts for 50% of the country's annual export earnings. In 1993 the mining industry's contribution to the Peruvian economy was represented by \$2400million paid in taxes, \$400million spent on local purchases and \$280million on imported goods. This accounted for over 11% of GDP (Down and Stock, 1995 cited in Acheampong, 2004:1). North America is the major producer of gold and silver. Raw mineral production in 1998 was valued at approximately US\$ 70 billion. The industry employs approximately 1 million people. Gold, the largest mineral foreign income earner in South Africa alone contributes 27.4% in mineral revenues. The gold industry is also responsible for 56% of South Africa's mine labour force (Mbendi, 2002). However, the United Nations Industrial Development Organisation (UNIDO) considers joblessness and landlessness (resulting from large scale mining) to have forced people into small-scale gold mining, and UNIDO estimates that there are over a million people directly involved in small-scale gold mining operations in Latin America. If Africa and Asia

are incorporated there could be as many as six million artisanal miners world-wide (UNIDO, 2001). For instance, there are no exact figures on the number of small-scale miners in Ghana, though it is estimated that approximately 100,000 Ghanaians are legally engaged in mining (Aryee, 2003). ‘Galamseys’ involved in illegal mining activities also create challenges for monitoring and regulating small-scale mining activities in the country. A UN study on artisanal mining and poverty reduction reports that there may be 50,000 – 80,000 people engaged in illegal small-scale mining activities in Ghana (Carnegie, et al, 2000).

In Ghana, the mining sector now accounts for 41% of the country’s foreign exchange and is the leading foreign exchange earner. Gold, the most important mineral, which now earns over U\$600 million and constituting almost 90% of the mineral output, has replaced cocoa as the principal foreign exchange earner (Awudi, 2002) “The most publicized benefits of the increased mining sector investments resulting from Ghana’s economic reforms include the following:

- Mining is the chief earner of foreign exchange in the country
- Provides substantial government revenue
- Provides capital and social infrastructure to the general public
- Generates direct and indirect employment
- Contributes to community development in mining areas”(Akabzaa and Darimani, 2001). “The industry generates revenue for the internal economy through the following sources:

- Salaries, wages and other payments made to workers and contractors
- Corporate income taxes, royalties, concession rents, services, customs and harbour duties

- Taxes on salaries of employees, and social security contributions from workers and their employers
- Dividends to shareholders
- Equipment and consumables purchased locally
- Import duty and purchase tax on vehicles
- Electricity and water charges
- Divestiture of state mining companies and sale of government shares”
(Akabzaa and Darimani, 2001).

Furthermore, it can be noted that since mining projects are usually located in remote sites, mining companies have had to invest in considerable physical and social infrastructure such as roads, schools, hospitals, electricity and water supplies. Communities within mine locations have generally been beneficiaries of some of these facilities. Thus, while mining projects usually have weak links with the rest of a host national economy, they can have a significant impact on the communities in which or near which the mines are located (Anyemedu, 1992 cited in Akabzaa and Darimani, 2001:35). Awudi (2002) has, however, noted that despite the over US\$2 billion FDI attracted in mineral exploration and mine development during the last decade, accounting for over 56% of total FDI flows to the country, (with the attendant increase in mineral export) this sector is yet to make any meaningful impact on the country's general economy. These sectors' contribution to the country's GDP is a meagre average of 1.5% since 1993. There is lack of linkage between the mineral sector and the rest of the internal economy. The massive investment has not been translated into significant increase in employment. Labour-intensive underground gold mines have been replaced by surface mining, which is capital intensive and

employs relatively few people. Large-scale surface mines only employ about 20,000 workers whilst over twice this number is involved in small-scale mining. State mines, now privatized, aim to maximize profits and have retrenched more than 50% of their workforce many of whom have moved to the informal sector.

3.8.3 Mining and Health

Health can be defined as a state of complete physical, mental and social well being of an individual, and not merely the absence of disease and infirmity (World Health Organisation, 2005). An alteration in the living cells of the body which jeopardizes survival in the environment results in diseases. Health problems arise from a variety of man's activities including industrialisation, farming, mining, migration and others. Available literature examines the impact of mining on the health of both mine workers and the people within the surrounding communities of the mines. According to Stephens and Ahern (2001), mining remains one of the most perilous occupations in the world, both in terms of short term injuries and fatalities, but also due to long term impacts such as cancers and respiratory conditions such as silicosis, asbestosis and pneumoconiosis. Studies of mining and health by type of mine process are divided into deep and open cast mines. Deep mines produce severe harms for employees in terms of their risks of high blood pressure; heat exhaustion; myocardial infarction and nervous system disorders. Studies of surface mining focus on coal, granite and rock mining and health risks related to dust breathing. In all levels of mining health risks occur with dust exposure (Stephens and Ahern, 2001). Respiratory impacts are the most studied and problematic of health impacts for mine workers. Injuries have declined in importance but continue to be an important safety issue in mines. Long-term effects include cancers, mental health impacts and some

proof of impacts on genetic integrity of workers. The heated discussion on the impact of the mining and minerals sector on both worker and community health is polarized. On the one hand the industry tends to underscore the supposed benefits of the sector, whilst on the other, community groups and NGOs suggest that the sector is injurious to health and sustainable development (Stephens and Ahern, 2001).

Further, the mining sector has been affected by the world-wide epidemic of HIV/AIDS, and this is apparent in the studies of South African mines. Several studies (Jochelson, Mothibeli et al. 1991; Campbell 1997; Williams and Campbell, 1998; Campbell and Williams, 1999; Campbell 2000; Corbett, Churchyard et al. 2000) have focused on the condition of the gold mines of South Africa. Migrant labour plays a vital role in the mining sector of South Africa, and these migrants are believed to play an important role in the transmission of HIV/AIDS. In terms of how the mining industry has dealt with this problem, one study (Williams and Campbell, 1998; Campbell and Williams, 1999) reports that “many mines made substantial efforts to establish HIV-prevention programmes relatively early on in the epidemic, (but) these appear to have had little impact”. Meanwhile, Corbett, Churchyard et al. (2000) investigated the combined effects of HIV infection and silicosis on mycobacterium disease in a South African gold mine, and concluded that the danger of silicosis and HIV infection combine in a multiplicative manner. This indicates that tuberculosis (TB) remains as much a silica-related occupational disease in HIV-positive as in HIV-negative miners, and HIV-positive silicotics have by far higher TB prevalence rates than those reported from other HIV-positive Africans. The increasing impact of HIV over time may indicate epidemic TB transmission with swift disease development in HIV-infected miners. There were relatively few studies

of policy initiatives by Stephens and Ahern (2001). According to them, health and safety improvements in mines have been developed over a long period of negotiation and struggle. Laws have come after union and management activities. Governments have supported organized labour in the improvements.

Moreover, Stephens and Ahern (2001) stress that scientific evaluation of long-term impacts has grown. Employees have been able to use scientific evidence for improved “hazard visibility” and for shifts in health and safety legislation. However, much of the small-scale mining sector falls outside formal legislative shield or scientific analysis. Companies have provided a range of community initiatives including vaccination programmes and health services. These have mixed results. Companies have seldom addressed the community claims for damage made against them internationally. Communities have worked with scientists to understand some of the impacts associated with living near mines. Unions have scarcely played an overt role in support for community claims (Stephens and Ahern, 2001).

In Ghana, available literatures on effects of mining on health are reviewed as follows. Biostatistics obtained from Obuasi hospital in a survey by Friends of the Earth-Ghana (FOE-Ghana) showed a high prevalence of upper respiratory tract infection (URTI) in the area which medical experts linked to the mining activities and associated pollution (Awudi, 2002). Clinical symptoms similar to arsenic poisoning have been observed in patients in AGC hospital at Obuasi and have been associated with aerial pollution from mineral procession by the AGC (Awudi, 2002).

In the Tarkwa area, with the initiation of mining investment, mining impact related diseases such as malaria, diarrhoea, upper respiratory tract infections, skin disease,

acuteconjunctivitis and accidents constitute the top ten diseases in the area according to biostatistics, obtained by FOE – Ghana in Korle-Bu Hospital in a survey in 2001. The area has the highest incidence of malaria in the Western Region and the country as a whole. Skin rashes are widespread particularly among communities living along rivers and streams which regularly receive leaked cyanide waste waters and other mining wastes within concessions (Akabzaa and Darimani, 2001).

3.8.4 Existing Initiatives to Reduce Risk and Maximise Mining benefits in the Communities

A number of studies (Ijsselmuiden, Padayachee et al. 1990; Jochelson, Mothibeli et al.1991; Williams and Campbell, 1998; Campbell and Williams, 1999) that focused on the HIV/AIDS epidemic and in particular the associated problems on the gold mines of South Africa have been documented. These studies highlight the particular problems with the mines and their dependence on a substantial migrant labour force that is drawn from both within South Africa and from neighbouring states. There is recognition that earlier on in the HIV/AIDS crisis many mines made substantial efforts to establish HIV/AIDS prevention programmes but that these seem to have had little impact. One possible reason for this is the inability of the prevention programmes to take account of the psychosocial environment of the labour force, and especially those migrants from neighbouring states that spend unlimited periods away from their immediate family and friends. In one of the few studies of community health programmes associated with mining in Latin America, Foreit et al. (1991) described the costs and the benefits of implementing child survival services at a private mining company in Peru. Here, despite extensive outlays for medical services, few children under age 5 were vaccinated, and half of their illnesses went

untreated. Children who were attended to at the company clinic usually received unnecessary medication. As a result of the study, the company hired additional staff to provide integrated maternal-child preventive health care and family planning and contracted for intensive training and periodic on-site supervision. In less than 2 years, vaccination coverage reached 75%, and virtually all children under age 1 were enrolled in growth monitoring. Prescriptions were reduced by 24%, including a 67% drop in antimicrobials.

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In Ghana, health-related environmental monitoring mandated in mining areas by Ghana's National Environmental Policy include monitoring air, water, noise, emissions and food contamination (Minerals Commission and Environmental Protection Council, 1994). Ghana Consolidated Diamonds Limited has a hospital on its company's grounds to serve the healthcare requirements of its company workers and their dependants, and the people of Akwatia, though it is sternly under resourced (GCD, 2001). The same can also be said of other major mining companies like Anglo Gold Ashanti, Goldfields Ghana Limited who do not only have hospitals and clinics to serve both workers and residents in the mining communities but also embark on other health education programmes. From the findings of their research, Stephens and Ahern have called for the need for more openness and transparency within the mining sector, particularly in countries of Latin America, Asia and Africa. There is a further need for in-depth long-term evaluation of the impacts of mining on health of workers and communities. There is evidence of long-term impacts of mining on health of workers and communities. This implies that the sector's activities currently undermine the human objectives of sustainable development, which are to protect the health of current and future generations. There is still a long

way to go before mining becomes a healthy work or a healthy development activity to take place in a community. There is also a long way to go before the industry, the workers and the community agree over the real health impacts of the sector and the real responsibility of each of the actors in the sector (Stephens and Ahern,2001).

3.8.5 Mining and the Environment

The adverse environmental impact of mining activities on the environment is well documented (Heath et al., 1993; Veiga and Beinhoff, 1997; Warhurst 1999). Particular attention has been directed towards the impacts of large scale and small scale gold mining activities on environmental contamination. While the land degradation caused by the gold mining is pronounced, chemical contamination from the gold extraction process imposes a double burden on the environment, with harmful health implications for mining communities and people residing in close proximity to such activities (Yelpaala, 2004). For instance, due to the informal nature of gold-mining in the South (Africa and Latin America), most studies concentrate on mercury exposure and intoxication incurred in the extraction and processing stage of mining (Camara, Filhote et al. 1997; Malm, 1998; Harada et al. 1999; Tirado et al. 2000; van Straaten 2000a; Rojas, Drake et al. 2001). Results of studies indicate patterns of mercury intoxication during the gold amalgamation process (Camara, Filhote et al. 1997; Tirado, Garcia et al. 2000; van Straaten 2000a; Drasch, Bose- O'Reilly et al. 2001). Most studies involve small numbers and are thus susceptible to predisposition, but some attempt more rigorous design. For example, in one site in the Philippines a study of 102 workers (occupationally Hg burdened ball-millers and amalgam- smelters), 63 other inhabitants (exposed from the environment), 100 persons living downstream of the mine, and 42 inhabitants of

another site (serving as controls) was undertaken. Bio-monitors and medical scores for both workers and the surrounding communities were taken. The authors report that “By this method, 0% of the controls, 38% downstream, 27% from Mt. Diwata non-occupational exposed and 71.6% of the workers were classified as Hg intoxicated”(Drasch, Bose-O'Reilly et al. 2001). Another study in Tanzania with a similar design found lower levels of intoxication and a more complex mix of mining-related and environmental exposures to mercury through household items such as soap (Harada, Nakachi et al. 1999). One study in Ecuador reports higher levels of intoxication in children involved in “gold washing” (Harari, Forastiere et al. 1997). One study in Venezuela found no mercury intoxication, despite occupational and community exposures (Rojas, Drake et al. 2001)

In Ghana several studies in mining towns have revealed that environmental problems such as land degradation, pollution and others are associated with mining activities. Some of these are enumerated below.

3.8.6 What is Small-Scale Mining?

Small-scale (and artisanal) mining has been defined differently around the world. However, as the United Nations (UN) and Intermediate Technology Development Group (ITDG) definitions quoted below show, small-scale mining” is generally defined in terms of a given production ceiling, or the level of sophistication with which minerals are exploited. Small-scale mining is any single unit mining operation having an annual production of unprocessed material of 50,000 tonnes Small-scale miners are “poor people; individuals or small groups who depend upon mining for a living; who use rudimentary tools and techniques (e.g. picks, chisels, sluices and pans) to exploit their mineral deposits” . According to the World Bank Group,

“Small-scale mining is largely a poverty-driven activity, typically practiced in the poorest and most remote rural areas of a country by a largely itinerant, poorly educated populace with few employment alternatives”. The World Bank also estimates that while some 13 million small scale miners are operating under harsh and risky conditions with minimal incomes in about 30 countries, as many as 80–100 million individuals depend on the activity for their livelihoods worldwide . In Ghana, small-scale (gold) mining is defined as “...mining (gold) by any method not involving substantial expenditure by an individual or group.

3.9 ENVIRONMENTAL DEGRADATION ON WATER AND FOOD PRODUCTION

Environmental effects of mining activities within the Amansie area have had consequent impact on water resources and food production in the District. Details of these are discussed below.

3.9.1 Effects on Water Resources

Water resources in Obuasi Municipality are not in a very good state. Most of the streams, rivers and other water bodies are either polluted with chemicals or are dried up. According to a report from the Amansie West District, all of the major streams and rivers like Ahinsu, Atetesu, and Aborakese are almost polluted by mining and other human activities (OMAMTDP, 2006). As the situation is now, according to an agricultural extension officer interviewed, there are no fishing activities within the Kwabrafo River since all species are dead due to intoxication.

Moreover, citrus crops along the Jimi River are no more eaten by residents due to contamination with cyanide and other toxic chemicals. About four years ago, it was

allegedly reported within the public circles that oranges from Amansie are contaminated with toxic chemicals which caused stomach ulcer and other complications. Although no test was conducted to prove the credibility of this story, however, the researcher is convinced that there may be an iota of truth in this, looking at the situation observed in the field. Most of the communities visited such as Manso Keniago, Manso Takorase, Manso Koniase do not have any portable drinking water. They either depend on filtered sachet water or dug bore holes for drinking and those who depend on streams and other water bodies are at risk of waterborne diseases.

In an attempt to remedy the water situation and related health problems in the area, Adanse Mining Company has resorted to the provision of alternative sources of drinking water in the form of dug bore holes in most of the affected communities such as Keniago, Datano, Takorase and Datano Anyinam, and others. The researcher identified some of these boreholes at the communities where the questionnaires were administered. However, there were some complaints with regard to the maintenance and quality of water that is pumped from these dug boreholes. Takorase and Datano for instance, the residents complained of poor quality of water that is pumped from the borehole and alleged that the water may have been contaminated with some chemicals underground.

3.9.2 Effects on Food Production

Within the Amansie West District, domestic food production is low compared to the needs of the entire area. Respondents attributed this to the mining activities, as several farmlands have either been reserved for mining activities or degraded. Land

degradation has resulted from the removal of the top soils, trees and vegetation with heavy machines for gold deposits. This has deprived the land of its nutrients and rendered it infertile for agricultural purposes. Consequently, few farmlands are available for farming activities. Even of the lands available, some have been contaminated with chemicals from mining activities. An official from the Ministry of Food and Agricultural Directorate at Obuasi claimed that there are cyanide and arsenic concentrations in the land that were used for farming purposes due to mining activities (surface mining). These are no more used for such activities since they are unproductive. Affected communities include Keniogo, Afraso, Fawotiritwe and others. In addition, tailings dams cover considerable portions of lands in communities such as Kwankyiabo, Datano, Keniogo and others. Moreover, considerable tracts of lands previously used by farmers at Takorase, Keniogo and other communities now fall within the concessions of Adanse Mining Company hence, farmers do not have access to such lands for farming activities. Effects of this situation on food production within the district are very remarkable.

Environmental effects such as land degradation and pollution of various forms (that is, air, water and noise) by galamsey miners are associated with both surface and underground mining as well as the method of gold extraction. Land degradation has resulted mainly from surface (open pit) mining. Air pollution has emanated from emission of dust and other particles into the air, emission of chemicals such as carbon, sulphur, arsenic from processing plants and waste disposed of into tailings dams. Noise and vibrations are essentially the effects of blasting of rocks with explosives from both surface and underground mines. Water pollution has resulted from intoxication of water bodies with chemicals such as cyanide, arsenic and other

suspended particles. As a result, water resources within the communities are not in a very good state as most of them have either been contaminated with toxic chemicals or polluted with waste from mining activities. Water quality tests conducted on major streams such as the Kwabrafo, Aborakese, Ahinsu and Atetesu rivers showed high concentrations of chemicals such as arsenic that were above WHO acceptable levels.

These have had adverse effects on food production in the municipality as most land has either degraded due to loss of nutrients or reserved for mining activities, resulting in a significant reduction in yield of major crops from 2001 to 2006. Evidently, the number of farmers in the Amansie West has reduced drastically due to shift (of labour) to the mining and commerce sectors, hence the situation.

3.9.3 Poverty

Poverty is where people have unreasonably low living standards compared with others; cannot afford to buy necessities, such as a refrigerator for example; and experience real deprivation and hardship in everyday life (McClelland 2000). According to International Labour Organization 2004, four of every ten Ghanaians still live in poverty. Many of them work in Agriculture, mostly as food crop farmers. Others are engaged in Micro and small enterprises, or finding a survival income as daily casual labourers.

Internationally, people who lack food and shelter for minimal needs are said to be living in absolute poverty. People are considered to be poor if their living standards fall below an overall community standard, and they are unable to participate fully in ordinary activities of society (www.bsl.org.au)

3.9.4 Degraded Environment and Vicious Cycle of Poverty

Research identifies poverty as the main cause and consequence of man-made environmental degradation in Ghana. Poverty is multidimensional and goes beyond the lack of an income to include those stated by the United Nations Development Programme (UNDP). Clearly we see that poverty is one reason why it is so important to attack or address environmental problems, both for present and future generations and for Ghanaians as a whole.

Walter et al (2005) point out that "environmental degradation and poverty are inextricably intertwined. The consequence of this linkage is vicious cycle in which poverty causes the degradation of the environment, and such degradation in turn perpetuates more poverty". Fabra (2002) adds that "poverty and environmental degradation are often bound together in a mutual reinforcing vicious cycle, and thus human rights abuses related to poverty can be both cause and effects of environmental problems.

In my view, if poverty is the main cause of environmental degradation in Ghana, then all the policies, campaigns, legislation and bylaws designed to protect the environment in Ghana will flounder if there is no significant improvement in the standard of living among the people. Fighting pollution, deforestation, erosion, exploitation of land is necessary for the protection of Ghanaians. "It is common knowledge that in most cases these ecological norms are often sabotaged by the very people who defined them because, deep within them lies a huge and dangerous love of money" (Kalembe 2010). As Kante (2004) notes "for the poor, nature offers a

series of goods of inestimable value, on which depend absolutely. That sums up their life.

In my view this relationship between poverty and environmental degradation is of course an extremely complex phenomenon. Environmental degradation come because they do not find any other way but to using the available alternatives eg drains for toilet, live in a place which is already polluted. We should not forget, most of the people are poor already, trying to come out from their poverty always worsen their problems.

3.9.5 Effects of Degraded Environment and Cycle of Poverty

Research has indicated that poverty is a major cause and effects of environmental degradation and resources depletion that threaten Southern Development Community (SADC) region. The effects of environmental degradation are many. Some of them are, deforestation, soil degradation, declining biodiversity, water scarcity deteriorating water and air quality. Urbanization is another issue bringing with it a range of human health and environmental problems.

3.9.6 Solution

Since the 1970s, it has been almost universally agreed that poverty and environmental degradation are inextricably linked. The World Commission on Environment and Development (Brundland Commission) wrote, I also strongly believed that poverty is a major cause and effect of global environmental problems including Ghana. It will be a serious mistake or incorrect to attempt to deal with

environmental problems without a broader perspective that encompasses the factors underlying world poverty.

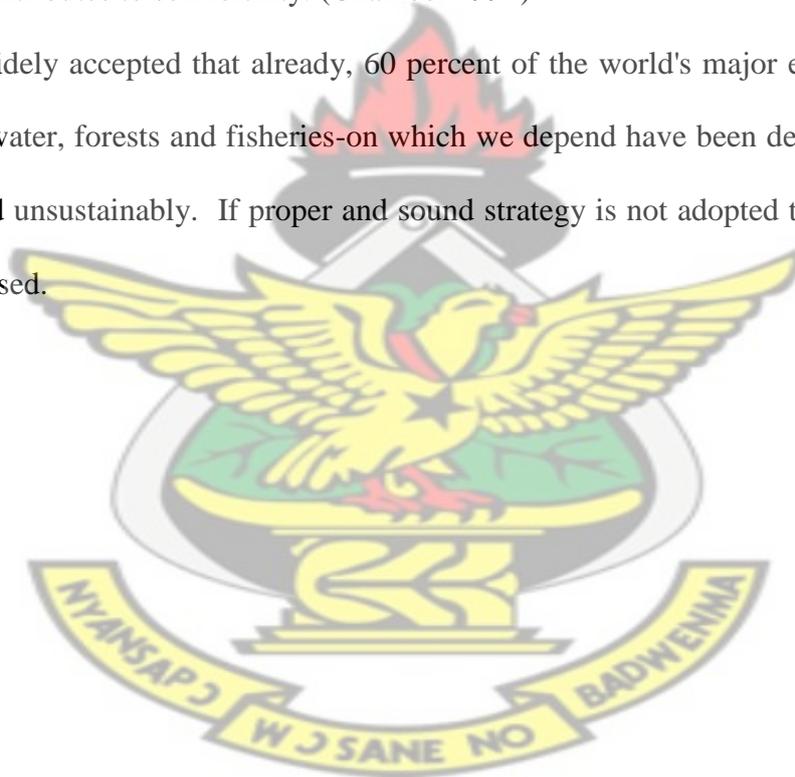
Much has to be done if we want to solve the problem of environmental degradation of the poor. It may seem difficult in the beginning because most the people are illiterate and may not admit or accept any learning activity that may help to alleviate poverty. Local learning on how to avoid environmental degradation and its subsequent consequences may help to reduce environmental degradation. Environmental education must be part of any discussions which must be focused on environmental strategies to reduce poverty. Leach M. says that awareness about the negative environmental externalities or adverse impact of certain development projects on the livelihood of poor people often does not go beyond the communities that are mostly severely affected. For instance, urban consumers of fuel-wood may be scarcely aware of the consequences of increased logging on the livelihood of the rural poor. He further stated that in such case environmental education can play a particular important, albeit in divided role by informing different segments of local population about issues relevant to the communities involved.

One other way to solve environmental issues and poverty has to do with awareness creation of environmental issues and its related numerous problems that the people face. Ekbom A, suggestion was prompt and timely that, environmental issues can be raised by public and private agencies, grassroots institutions, through changes in school curricula, and by creative use of the local media. Even in the absence of direct links with political parties, various environmental conflicts in India have gained national attention as a result of work by the media and professional groups.

To the researcher's knowledge education in its sense is a process but not the end so if communities are educated, they will also teach their generations and on we pass the knowledge to solve environmental degradation.

Shared rearing of livestock is another strategy used by the poor across regions and countries (Beck 1989). The construction of fish-ponds in semi-humid conditions allows farmers to establish many nutrient linkages with other aspects of a farming system. The fish for example, consume crop residues and leaves, and fish manure in turn contributes to soil fertility. (Chamber 1991)

It is widely accepted that already, 60 percent of the world's major ecosystems from soils, water, forests and fisheries-on which we depend have been degraded, polluted or used unsustainably. If proper and sound strategy is not adopted the situation will be worsed.



CHAPTER FOUR

THEOLOGICAL REFLECTION ON ENVIRONMENTAL DEGRADATION

4.0 INTRODUCTION

If Christians will have a better understanding for the purpose for which God created the universe and the things therein, and be able to think deep how God continues to relate to nature and the environment, they will have a definite responsibility by taking care of the environment. In any case, if we degrade the environment, destroy nature and spoil the good relationship between man and God we do that to spoil the relationship between man and God. Karl Barth writes:

God did not remain satisfy with his own being in Himself. He reached out to do something beyond, willing something more than his own being. He willed and posited the beginning of all things with himself. But this decision can mean only an overflowing of his glory. It can consist only in a revelation and communication of the good which God has and also is in himself.(1993)

God in his own knowledge, wisdom and power thought that His abode should not be the only place of habitat and existence, but with love and purpose created the environment that we have ourselves. Peter Brunner wrote in the following words:

God will not have to blessedness of his own intra – divine life for himself alone. In groundless love He wills to have creatures which shall share in His life within the limits of their creatureliness and which in such participation and fellowship shall be blessed, in that they received his divine glory and as in a mirror reflect it back upon him.(1946)

To God, without creation, He sees Himself as incomplete and for that matter there must be creation so that man and nature will appreciate his love, goodness and mercies in the things He created. The discussion goes on as we look at Theology of nature in our subsequent deliberation.

4.1 THEOLOGY OF NATURE

Bonheoffer (1988) defines theology of nature as attempts to understand the role and character of nature (its meaning, purpose, relationship to God, etc) from a foundation of Christian theology.

As one reads through the creation story in Genesis, discovers how God relates to us, we need not to be told the need to protect the environment. It is for our own good. God could have done it anyway He wanted it. Any how we see it, we need to cherish it, protect it and leave it to the generation to come. For us to understand theology of nature, we need to accept this from onset that God is the creator as been told about in the Biblical doctrine of creation. Seeing and accepting God as a creator will help us to deal with some questions and how to answer them. Even if we fail to provide answer at all, it calls for rethinking about our attitude towards nature.

Questions like, is it true that God is the creator? Does God create and then abandon us? We should not waste much time on those who do not believe but leave them in their own thinking because the Bible tells us that God is intimately involved with his creation at all places and all times.

For the wrath of God is revealed from heaven against all ungodliness and wickedness of those who by their wickedness surpasses the truth. For what can be known about God is plain to them, because God has shown it to them. Even since

the creation of the world His eternal power and divine nature, invisible though they are, have been understood and seen through the things he has made. So they are without excuse; for though they knew God, they did not honour him as God or give thanks to him, but they became futile in their thinking, and their senseless minds image resembling a mortal human being for four-footed animals or reptiles.

There is this scripture which suggest that the creator-creature relationship precludes any interrogation of the former by the latter.

Woe to him who strives with his Maker, an earthen vessel with potter. Does the clay say to him who fashions it, “what are you making?” (Isaiah 45:9; Job 9:12; Daniel 4:35)

Indeed, it is dangerous to strive with your maker. George S. Hendry added to this discussion that faith in God the creator involves an element of mystery. But if the mystery is intensified to total ignorance, the confession of faith is reduced to the profession of agnosticism – as when the expression “God knows” is used in vulgar speech as a substitute for “No one knows”. If faith in God as the creator of the world does not carry with it some understanding of creation that contains at least the possibility of an answer to the question why the confession is vacuous.

In reflecting on this matter, theology of nature, my thinking has been drawn to another issue which the researcher think will add impetus to the discussion – God, nature and humanity. “The world shall continue to have a worsening ecological crisis until we reject the Christian axiom that nature has no reason for existence, save to serve man”.

Thus, Lynn White concludes on the contribution of Christianity to the ecological crisis. Briefly summarised, White's thesis is that modern science and technology, although now international have their origins in the West. He further stated that to this development, Christianity makes no small contribution story which, according to White, decisively introduces the notion of historical development, stress the transcendence of humanity over nature and last claims that nature has been created by God for the benefit of humanity.

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In any way if Christians think that way, then they have not been proper custodians of nature. We may agree as a matter of historical record or base on history from Bible that nature meaning that which is other than humanity, emerges or rises at the beginning of modern period. Adding his voice to the discussion, Karl Marx captures modernity's objectification of nature in the hope of its mastery by humanity:

Subjection of nature's forces to man, machinery, application of chemistry to industry and agriculture, steam navigation, railways, electric telegraphs, clearing of whole continents for cultivation, canalisation of rivers, whole populations conjured out of the ground what earlier century had even a presentiment that such productive forces slumbered in the lab of labour.(1998)

The Yahwist creation narrative shows too that the creation of humanity is exclusively the work of God; "Then the Lord God formed man from the dust of the ground, and breathed into his nostrils the breath of life; and the man became a living being" (Genesis 2:7). Gerhard von Rad called this verse" a locus of classicus, [a classical assertion] of Old Testament anthropology. Hans Schwarz made derogatory

remarks that if one looks carefully at Genesis 1:26 ff., one can easily discern the special position of humanity. Already in the initial more, “Then God said, ‘Let us make humankind’”. When we look at the above quotation clearly, we can assert that, there is a special decision of God to make.

4.1.1 Divine Preservation of Creation

The creation of the world was for a purpose. It has not been set without purpose or divine direction. If the creation was done with an intention, then humankind must do all that they can to preserve the things that God created. If Christians or humankind cherished the things been created by God, then there is something that must be done. What we have to know is that God himself know how to preserve it. But He doesn't stay with us, like creation, God has, God's providence is a Trinitarian activity. The Lord who exercises providence is none other than the Lord and father of our Lord Jesus Christ, and that providence is none other the Lord within the word.

Even though we don't see God living with us, He is always controlling our activities so that the world will continue to be a better place for us to live. The Biblical doctrine of providence is demonstrated in the concrete experiences of Israel and her neighbours. There are so many of them when you read through the Bible in the Old Testament and in the life of Jesus Christ and the development of the Church in the New Testament. As such, divine providence is a sign of God's steadfast covenant love with his people. The history of the Jews in the Old Testament exists as a powerful witness and a sign of God's interviewing covenant love – a love ultimately revealed on the cross. The Bible says:

And he is before all things, and by him all things consists. (Col. 1:17)

This means that nothing in creation is self-sufficient. God is responsible for both the origin and the preservation of all creation. Hans Schwarz (2002:187) said that: without God's continuing preservation of the creation the Cosmos will cease to exist. No atom of the universe is self-sufficient – all is utterly dependent upon God's gracious sustenance. He went on to say that to affirm providence as divine preserving is to acknowledge that creation has limits. That these limits do not rule the creature. It is due to God's acting preservation. To him this is not a passive divine activity. God enters into world occurrence and ordains that it should exist. This is not to suggest that God creates the world anew each moment, as has been suggested by some theologians. Hans Schwarz in his book creation said that: when we talk about divine providence, however, we do not turn to the past. Our attention is directed towards the present. The conviction is uttered that, God has the present in his hands here and now and therefore our future is decided too. He made the assertion that the future will not open itself in any possible way. It will open only in the manner which is sanctioned by God. With this assertion we do not just focus on the cosmos but also humanity and its conduct and history. He added that Divine providence, therefore, extends to nature. We remember that all natural processes presuppose nature and matter. Yet these presuppositions cannot be taken for granted, because there is insufficient reason to suppose that an initial singularity occurred. He ended his submission by saying that Divine providence, therefore, asserts first of all that God continues to preserve his creation.

Martin Luther, for instance, was much more impressed by the continuous preservation of God's creation than by initial creative act. He remarked that many people start something but most do not have the energy to continue it.

4.1.2 Preservation within Nature

Preservation of nature is very essential because it serves as the foundations of human existence. It is said almost everywhere that when the last tree dies, the last person will die. It is true because nature provides us with varying degrees of dependability which can be understood as a result of God caring for humankind. If nature is well preserved, it will help us to maintain and sustain the environment in which we live. For example, adequate water supplies of high quality is necessary both for community use and local ecosystems. Communities as well as other creation require proper care to be able to fulfil the purpose for which they were created. For this reason, we need to work hard to preserve nature so long as we continue to live in this world without knowing the very day this beautiful, well planned nature will be destroyed as indicated in the Bible;

As long as the earth endures, seedtime and harvest, cold and Heat, summer and winter, day and night, shall not cease. (Gen 8:22)

How nature or the environment will look at for 50 years to come will depend on us. Our land has a beautiful and varied landscape with many distinct ecosystems, if we desire nature to always look better with running streams, clean water, clean air and want to live something better for our generation, then we need to invest now. For the sake of the future it is not incumbent upon us to complete the work, but neither are we you at liberty to desist from it.

God has created nature to the extent that the nature preserves itself. Things work naturally like that and it is very wonderful. Hans Schwarz called it degrees of dependability which can be understood as the result of the caring activity of God. According to him, the first kind of dependability is represented in the rising and

setting of the sun and in the cycles of seasons. He stated that they provide the foundation for the development of life on earth, as far as we know, is fully reliable. The second reliability asserted by Hans is a different kind which arises when several alternatives and large numbers of repeated incidences are involved. To him we encounter this, for example, in chemical reactions when wood or other fuel is burnt. If these natural dependencies failed us, we will be in big trouble because our very lives solely depend on them Everything is in the total control of God, without his care and permission we are nothing. The Bible confirms that:

Are not two Sparrow sold for a farthing? and one of them shall not fall on the ground without your father. But the very hairs of your head are all numbered. Fear not, therefore, ye are of more Value than many sparrows. (Matt 10:30-33)

4.2 PRESERVATION WITHIN MORAL CONDUCT

Morality is the system through which we determine right and wrong conduct – i.e. the guide to good or right conduct.

Gordon (1957) has this to say that, whatever God commands, it will be men's duty to perform (which is certainly true) this is built upon a supposition that God is good, for otherwise there could be no such thing as virtue or vice" A moral theory, then explains why a certain action is wrong – or why we ought to act in certain ways. In short, it is a theory of how we determine right and wrong conduct. Prisen (1957) asserted that for religious people, the fact that God has commanded them to do something is a sufficient reason, perhaps the only reason for thinking themselves obliged to do it. He went on to say that this is because they have a general pro-attitude to doing whatever God commands; the mere fact that God commands

something is no more reason for the fact you ought to do it cannot be entailed by the fact that God has commanded it.

God maintains and guides his creation through our conscience. Hans Schwarz said that in the natural process God's continuous creative activity is dominant; however, in the moral process God's preserving creative activity rules supreme. God endows humanity with certain guidelines within which it can unfold itself and which may aid it in finding its proper place within creation. If we want to take care of nature then we need to approach it with a clear and good conscience especially, if we want to take proper care of the environment. Not that we want to please people but we should see it as a moral duty to control not to destroy or exploit it. Preserving nature through more conduct, we should be guided by everyday doings and thinking. By doing that it forms a judgement about what is right and wrong.

In talking about what is right and wrong, Hume(1967) also argue that, now that we consider something just and right because nature teaches us, we do not consider something just and right because we arrived at it through human convention. We can't look down on what Charles Darwin's said that human moral and mental faculties differ in degree rather than in kind from the capacities of animals.

Nature itself presents to us what we ought to do and ought not – the right to life does not require that we give what is needed to sustain life. For example using poisonous chemical for fishing which will kill somebody is a serious moral issue. J. J. Omeregbe observes with insight:

To say that action is morally evil is to assert that the action in question has violated an objective moral order and destroyed a value. This

assertion can be true or false, it is not simply an expression of an attitude or feeling, but an assertion that can be challenged, that can be contradicted, that can be shown to be true or false. (2001)

Han's has this to say, by nature the behaviour of human beings is not as free and unspecified as we might initially assume. To be a human being means to act according to certain norms that enable us to live together and further our own species. For Arnold Ravin as well as for Konrad Lorenz and his followers, morality is natural.

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4.3 DEVELOPING CHRISTIAN UNDERSTANDING OF CREATION

This aspect deals with developing the Christian concept of education. In other words, how the Christian perceives the creation story. Indeed, Christians believe that God created the world (Universe) and placed Adam in the Garden of Eden. In the Garden of Eden, God gave man power to control everything, By this power man was able to control and continue creation by using the power given to man to transform the things been created by God for his benefits. The onset of our belief and understanding is based on the Bible in the beginning. It will be wrong for us to use any other book to confirm our argument without the Bible.

According to Hans Schwartz (2002) in the Old Testament the term 'bara' (to create) has special theological/significance. It is used to express clearly the incomparability of the creative work of God in contrast to all secondary products and likeness from already existing material by man. Explaining it further he said is used exclusively for divine activity, to him, it is not significant than the exilic or postexilic period. Therefore, it can be regarded as certain that 'bara' was introduced into OT literature

as a theological idea for the first time in the exilic period. This theological information is very important because it is giving us some basing of creation. The word bara as explained by Hans is used several times. In fact, not one but more than three times. In Gen. 1:27' bara' is used three times in connection with the creation of humanity. Explaining it further, he said that the verb (bara) is associated with salvation. It refers to the activity of God in the immediate clearly in Isaiah 48:7 “They are created now, not long ago”.

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To Schwarz this new creative activity extends also to the force of nature, so that barren land is turned into a fertile and wooded area (c.f 41:18ff., where bara is used in v 20). In 45:8 we even read that God created (bara) the conditions under which salvation can originate.

Creation is based largely upon chapters 1–11 of the book of Genesis. These describe how God (Hebrew) Elohim calls the world into existence through the power of speech (“God said, Let there be light” etc) in six days, calls all animals and plants into existence and moulds the first man from clay and the first woman from a rib taken from the man’s side; a world-wide flood destroys all life except for Noah and his family representatives of the animals.

Hans Schwarz (2002) grouped the creation narratives into two. First, the priestly narrative in Gen. 1:1-2; 4a and the Yahwist narrative in Gen. 2:4b-24. He stated that right at the beginning of Priestly narrative we read the important theological confession: “In the beginning when God created the heavens and the earth...” the subsequent sevenfold partition of the narrative is supposed to show that everything in the Cosmos owes its existence to God-power and might. In fact, that is the present

understanding of Christians for now. And of course it will not change. “In wisdom you made them all, the earth is full of your creatures. There is the sea, vast and spacious, teeming with creatures beyond number—living things both large and small ... When you send your Spirit, they are created and you renew the earth (Psalm 104:25-30)

In the 1960s according to some readings made by the researcher there is another branch of creation called the creation science or scientific creationism, which attempts to provide scientific support for the Genesis creation narrative in the Book of Genesis and disprove generally accepted scientific facts, theories and scientific paradigms about the history of the Earth, cosmology and biological evolution. All that it does is to provide scientific evidence for evolution. The main idea in creation science is the belief in creation and challenges the geologic and the idea that fossils found in geologic and astrophysical evidence for the age and origins of Earth and Universe.

The second kind of narrative Hans described is the Yahwist narrative, which begins in Genesis 2:4b, does not present an account of the creation of the world. Strictly speaking according to him, it presents only an account of the creation of humanity. He explained further that this event dates back to the earliest history and presupposes the actual creation of the world. To him it is Yahweh who gives the rain and thereby the possibility for things to grow and thrive. The threatening sea water of which the Israelites did not learn until the Babylonians exile is not mentioned. Whitehead is absolutely right about this, He is not a Christian, but he understands that there would never have been modern science without the biblical view of Christianity.

Schaefer responding to this statement made by Whitehead commented that it is the same in the area of creation. It is the biblical view of nature that gives nature a value in itself; not to be used merely as a weapon or argument in apologetics, but of value in itself because God made it.

Schaefer (1972) made a remarkable statement that Christians understand that we men are all from one origin. We are all of one flesh; we are of one blood. In other words, one can say that, from the biblical viewpoint, there are two humanities; one, the humanity that stands in revolt against God, and the other, the humanity that used to revolt against God (because none of us came into this second humanity by natural birth).

As a Christian anytime the researcher sits down to ponder over creation, there is one picture that comes to my mind. I find it difficult to think beyond creation. It is like opening a book backwards. The last page you open closes the book. The approach to this creation account asking what could make it mean rather than asking what the numerous authors have intended to mean. The story would have been different, if I am not a Christian. In fact, from the time of my conversion I have come to agree or accept that scripture was the word of God. And that from a child thou hast known the Holy Scriptures, which are able to make the wise unto salvation through faith which is in Christ Jesus. All scriptures are given by inspiration of God and are profitable for doctrine, for reproof, for correction, for instruction in righteousness (2nd Timothy 3:15-16). So I have been telling not to force any interpretation onto a text. Because if I misinterpret it, I may misrepresent God, which is a serious abomination. For I testify unto every man that heareth the words of the prophecy of

this book. If any man shall add unto these things, God shall add unto him the plagues that are written in this book.

The researcher believes that there are a number of preachers, teachers and prophets who are preaching that the Bible is the inerrant word of God and at the same time, perhaps without realizing it, are treating the creation text as moulded rather than read. When scripture is handled that way the word of man masquerades as the word of God. Young's reminder is very timely and appropriate in this context:

It is of course true that the Bible is not a text book of science, but all too often, it would seem, this fact is made a pretext for treating lightly the context of Genesis One. Inasmuch as the Bible is the Word of God, whenever it speaks on any subjects, whatever that subject may be, it is accurate in what it says.(1999)

As noted in my earlier submissions, what the Bible says is final. Especially narratives concerning creation. All other books, submissions, journals cannot be compared to what the Bible teaches concerning creation. To conclude this section, I would like to state emphatically and categorically that Christians understand and accept the story to be true.

4.4 CHRISTIANS RESPONSIBILITY FOR THE ENVIRONMENT

Encouraging Christians to be environmentally friendly and become responsible for the environment has become popular during recent years. In order to understand our responsibility it is important to comprehend the original relationship between man and nature.

The book of Genesis 1:26-28 tells us that God created man and woman in his own image and God gave them dominion over all the earth. This includes all the animals that God had created as well as the entire earth. It did not stop there, but God also charged their descendants with the care for all the earth. I know I will not be far from right if I include that, even after the curse and the fall of man, God never withdrew this responsibility. We must care for the world that God has given to us.

Although scriptures are in general agreement with many of the ecology groups that man is responsible for his environment, Christians may disagree with them on the question of why the environment is important and how it should be maintained (Christian Answers. Net). The brain behind this ecological friendliness and care stir from the fact that cleaning the environment is important because the future of mankind is endangered. Some other caring environmentalists also point to issues like the Ozone depletion and global warming to support their claims.

The researcher hereby disagrees with them. Because they want to paint the picture like human race is in jeopardy. What I know from the Bible is that, God is in absolute control of our destiny. He has planned the future for mankind. The Bible tells us that the earth will someday be restored by Christ.

The nature (creation) itself will be set free from its bondage to decay corruption [and gain an entrance] into the glorious freedom of God's children. (Romans 8:21), and ultimately God will destroy it by fire, replacing it with a new heaven and a new earth. Death will be no more mourning and crying and pain will be no more for the first things have passed away (Rev. 21:4)

We can deduce from the above assertion that the Bible is very specific about the fact that the restoration and ultimate destruction of the earth is God working and is not

related to man's "fire turning" of the environment. The source of our existence does not originate from ourselves, but from the Absolute Being. Therefore, we continue to exist because of our communion with the source.

Nature as well as the Universe does not work like a robot but a living organism receiving life from the source of life. A branch that is cut off from a tree, withers and dies. In the same way, the world cannot exist without Divine Providence.

Clark (1957) asked some questions that what is our responsibility for the environment; natural context of our lives and culture? Is it really our duty to use all things so as to preserve and elevate the distinctively human life, may be engineering little enclaves (Zoos or Safari Parks) within which nature can be painlessly inspected, or preserving larger habitats in the not usable hope that we may eventually find some useful drugs or usable experimental animals therein.

Indeed, Christians have a lot to do to protect and preserve the environment in which they live in. When we don't do what we are supposed to do and there are effects or some sort of consequence we will suffer. Clark(1957) said that, "when we harm the earth, we harm ourselves". Christians must be responsible for the environment. The following are some of the actions Christians can take to take care of the environment;

To begin with Christians read the Bible and go by what the Bible tells them about how to be responsible for the environment. One area which Pastors, Reverend Ministers don't talk much about is the area of environment. We preach about a lot of themes like Holiness, Peace, Caring for one another, but not caring for nature.

One Yale University study found that “knowledge of the creatures, respect for the creation and understanding ecological relationships was inversely related to the frequency of Church attendance”. Mary N. Getui said that, dedicated Christians were the least likely to be interested in ecological issues. Christians seem to be slow and unconcerned about ecological issues. Why do they seem to be silent in the area of the environment. Probably, they think that there is nothing they could do about it because we live in the world of sin. It could also be that they think they lack logistical materials that will help them to preserve the environment.

According to Addo Obeng, perhaps they believe that the world is not worth protecting, especially since a Christian ultimate destiny is in heaven. He further said that this belief, however, clearly contradicts God’s direct command for mankind to care for the environment. To him another reason is that some Christians may fear the prevailing pantheistic influence on the environment.

In addition, churches should make their part by integrating biblical roots, bible concepts, insights, and Christian principles about creation during class meeting, home cells, Sunday schools and Sabbath schools. Being a Christian for some time, what I have observed is that some churches have made environmental issues no go area, untouchable and steer away from discussing it. When it happens this way, it doesn’t encourage the Christian to think about creation.

Again teachers, instructors and moderators who are Christians should take it upon themselves to explain the creation stories about nature well within all the other tribes so that children who are learning from creation will become responsible right from childhood. Teach the child where he/she goes so that when he/she grows, he/she will

not depart from it. In the same way parents should always visit their wards in school, check from their notes to see if the curricula have something to teach children about creation and if indeed teachers are really working on it.

Last but not least, Christian organizations, associations and groups should work hand in hand with the government and politicians to practise sound ecological principles including such things as recycling. Even though it is capital intensive and demands a lot of skill labour, if we take the bull by the horn, it will go a long way to protect the environment. People in their offices and in their homes should develop practices which will help the environment. When all these suggestions are well packaged, addressed and noted, it will go a long way to save the environment.

4.5 EARTHLY THEOLOGICAL AGENDA

Christians relationship with God is an important as their relationship with nature. At first, Christians were focusing their attention on God, themselves and their neighbors. According to Mcfague the context has broadened to include what has dropped out of the picture in the past few hundred years- the oppressed neighbours, the other creatures and the earth that support us all. He went further to say that this shift could be seen as a return to the roots of a tradition that has insisted on the creator, Redeemer God as the source and salvation of all that is.

Humankind have come to notice or realize that without nature or the environment they can't survive even though God exists. God has provided all the things like trees, air, rivers, forest, land that man will need to be able to survive like trees, air, rivers, forest, land so that life will be well and meaningful. But the things are not the end.

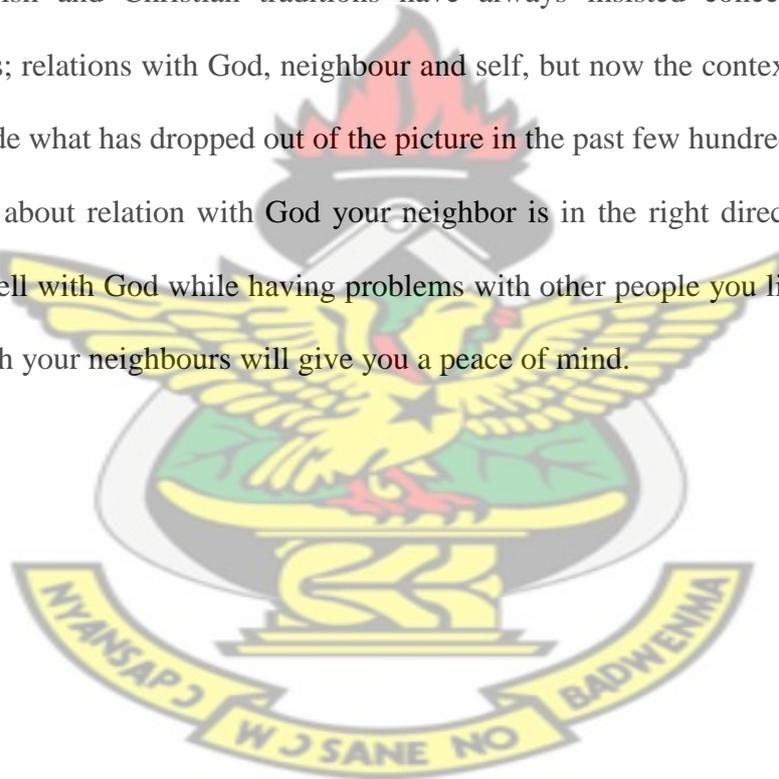
We have to make good use of them so that we can benefit from their existence, but not to take advantage of it. People now care about the consequence of the things they do against nature. Due to the consequence, we now take a second look at nature. Our attention is been drawn to the destruction that we cause against nature. The focus is not on ourselves now but the planet in which we live on. More especially, when the world is gradually becoming a global village.

We need to also know this because the two move together, that is taking care of the poor, the needy and the oppressed as well as nature. The two are interrelated. I am one of those who speak against the Western taken advantage of the developing or poor nations to make themselves rich. This has been done so long a time. Even though some other religious groups have commented on that the researcher believes The World Council of Churches should seriously look at the matter again. We seriously need a theological reflection. Mcfague said that while the nuclear threat has lessened somewhat, the threat of ecological deterioration has increased; they are related as 'quick kill' to 'slow death'. In other words, we may have been given some time. We need to use much of it. The agenda this shift sets for theologians is multifaceted, given the many different tasks that need to be done.

He went on to say that, this paradigm shift, if accepted, suggests a new mode of theological production, one characterized by advocacy, collegiality and the appreciation of differences. As stated by Juan Segundo, theology is not one of the "liberal arts", for it contains an element of the prophetic, making it at the very least and unpopular enterprise and at times dangerous one. He further stated that the academic has been suspicious of it with good reason, willing to accept religious

studies but aware that theology contains an element of commitment foreign to the cannons of scholarly objective (Marxist or Freudian commitments, curiously have been acceptable in the academy, but not theological).The researcher want to say that, religion is commitment to the divine and we do that with a clear conscience to improve our relationship with the one we serve. It does not call for somebody to be a scholar before one can be committed to the divine. Mcfague ended his submission with the following statements. Theology is an "early" affair in the best sense of the world; it helps people to live rightly, appropriately, on the earth, in our home. It is as the Jewish and Christian traditions have always insisted concerned with right relations; relations with God, neighbour and self, but now the context has broadened to include what has dropped out of the picture in the past few hundred years.

Talking about relation with God your neighbor is in the right direction. You can't relate well with God while having problems with other people you live with. Living well with your neighbours will give you a peace of mind.



CHAPTER FIVE

CLIMATE CHANGE IN AMANSIE WEST DISTRICT

5.1 DEFINITION

Climate change refers to general shifts in climate, including temperature, precipitation, winds, and other factors. Global warming (as well as global cooling) refers specifically to any change in the global average surface temperature. Global warming is often misunderstood to imply that the world will warm uniformly. In fact, an increase in average global temperature will also cause the circulation of the atmosphere to change, resulting in some areas of the world warming more, others less. Some areas can even cool. Unfortunately, although it significantly misrepresents what really happens, the term 'global warming' is still often used by media and others to describe climate change.

Climate change is a long-term shift in the climate of a specific location, region or planet.

The shift is measured by changes in features associated with average weather, such as temperature, wind patterns and precipitation. What most people don't know is that a change in the variability of climate is also considered climate change, even if average weather conditions remain the same.

Climate change occurs when the climate of a specific area or planet is altered between two different periods of time. This usually occurs when something changes the total amount of the sun's energy absorbed by the earth's atmosphere and surface. It also happens when something changes the amount of heat energy from the earth's surface and atmosphere that escapes to space over an extended period of time. Such changes can involve both changes in average weather conditions and changes in how much the weather varies around these averages.

5.2 CAUSES OF CLIMATE CHANGE

Humans cause climates to change by releasing greenhouse gases and aerosols into the atmosphere, by changing land surfaces, and by depleting the stratospheric ozone layer. Both natural and human factors that can cause climate change are called 'climate forcing', since they push, or 'force' the climate to shift to new values. Changes can also be caused by natural process like volcanic eruption, variation in the sun's intensity or changes in the ocean circulation or land surface. Large water bodies can also cause changes in the weather.

Earth's climate changes naturally. Changes in the intensity of sunlight reaching the earth cause cycles of warming and cooling that have been a regular feature of the Earth's climatic history. Some of these solar cycles - like the four glacial-interglacial swings during the past 400,000 years - extend over very long time scales and can have large amplitudes of 5 to 6°C. For the past 10,000 years, the earth has been in the warm interglacial phase of such a cycle. Other solar cycles are much shorter, with the shortest being the 11 year sunspot cycle.

Other natural causes of climate change include variations in ocean currents (which can alter the distribution of heat and precipitation) and large eruptions of volcanoes (which can sporadically increase the concentration of atmospheric particles, blocking out more sunlight).

Still, for thousands of years, the Earth's atmosphere has changed very little. Temperature and the balance of heat-trapping greenhouse gases have remained just right for humans, animals and plants to survive. But today we are having problems keeping this balance.

Because we burn fossil fuels to heat our homes, run our cars, produce electricity, and manufacture all sorts of products, we are adding more greenhouse gases to the

atmosphere. By increasing the amount of these gases, we have enhanced the warming capability of the natural greenhouse effect.

It's the human-induced enhanced greenhouse effect that causes environmental concern, because it has the potential to warm the planet at a rate that has never been experienced in human history.

5.3 GLOBAL WARMING

5.3.1 Definition

Until recently, the issue of global warming appeared to be very controversial. There were and in some cases still are critics and skeptics in both politics and science who simply did not believe global warming was taking place on such massive scale. Global warming is the global increase in the average Earth's Temperature due to increase in heat. On the other hand, global cooling is the widespread of temperature loss around the globe. Global warming is nullified by global cooling. Increase temperatures will lead to changes in many aspects of weather such as wind patterns, the amount and type of precipitation and the types and frequency of severe weather events. (EPA report on global warming)

Today, global warming is an issue that does not involve much controversy in terms of its existence. However, the argument, over the causes, impact and responsibility of global warming is still a hot topic.

Global warming is a phenomenon which has been occurring over the past 15,000 years on Earth. It can be described as a struggle between human progress (in the form of industrialization, population increase and economic growth) and nature. The process of global warming occurs when green house gases (primary CO₂, NO₂,

Methane, nitrous oxide, hydro fluorocarbons, per fluorocarbons and surfer hexafluoride) are released into the atmosphere (Motavalli, 2003).

In order to prove that global warming is, in fact, taking place, scientist first had to show evidence that the Earth is becoming warmer and indeed the inhabitants can feel it. Not only that they can feel it but the evidence shows on crops and other living things. According to Motavalli, Scientists can drill out core samples from glaciers in the form of ice core samples. They can do this to determine the GHG concentration in Earth's atmosphere from 400,000 years in the past.

Willie Dansgaard explains "The composition of the ice itself tells us about the temperature and atmospheric conditions at the time the ice was formed. So going deep into the ice is like sticking a thermometer backs in time.

5.3.2 Effects of Global Warming on Human Lives

It is clear that global warming is right here which effects is greatly affected. Current studies from the International Panel on Climate Change (IPCC) indicate that the Earth's surface temperatures could rise by 3.8 to 11.2 degrees Fahrenheit over the next 50 years, based on current green house gas (GHG) emissions (Motavalli, 2003). This increase in temperature would have profound effects across the globe, ranging from increase sea-levels, more severe storms, and the melting of large glaciers and iceberg. These changes in nature would in-turn produce devastating results in the form of floods, loss of plant and animals life, more frequent droughts and famine, and a greater risk of human casualties in all parts of the world.

The changes according to Linda Rose Pax in Earth weather patterns as a result of global warming can be seen all over the globe. Many of these changes have never been seen or experienced before, and effects on the people and habitat in those areas.

What I can say is that the alarming world's global warming is very dangerous for mankind and ecological balance. If we don't control it, no men, animals will be able to live, grow and thrive. The effect is too great. Statistics shows that Ghana requires about \$314.1 million to execute climate change of global warming in the country. The report, which has been corroborated by other studies, indicate that Ghana needs the money for its human intervention to reduce carbon emissions by 2020.

In Ghana, the effects of global warming is great and is gradually being experienced in many parts of the country, particularly in the Northern regions and along the coast. Global warming has resulted in severe droughts in the dry season, severe floods, high nature, influx of pest and diseases which are threatening the livelihood of the people. (Daily Graphic September 12, 2012)

In a similar related effect, findings have been observed in Antarctica from NASA satellites. Antarctica's ice sheet Shrank significantly from 2002 to 2005 and it continues to decrease. Its ice sheet lost 36 cubic miles of ice per year (one cubic mile is equivalent to 264 billion gallons of water) (Current science, 2006). The total melting increased global sea levels by an estimated 0.5 inch. This increase in sea levels may seem extremely small. However, when considering that the Earth surface is over 70% water, an increase in 0.05 inch is an extremely large amount of water (roughly 9.504 trillion gallons). The melting can cause potential hazards, damaging roads and buildings from run-off and landslides (Creffier, 2007)

Change and Arctic System Research at the University of Alaska explains, “In Alaska, people are more aware of warming problems because it’s staring you in the face. You can’t deny the evidence because it’s all around you”. (Sherwonit, 2004). The native people of Alaska, namely the Inupiat and Athabascan Eskimos, are having problem to adapt to the ever-present changing environment. Their hunting,

fishing and harvesting activities are now more difficult to sustain, resulting in food shortages as explained by Willie Goodwin.

Climate change is more than a warming trend (which is why the term “global warming” is an inaccurate description of the phenomenon). Increasing temperatures will lead to changes in many aspects of weather, such as wind patterns, the amount and type of precipitation, and the types and frequency of severe weather events. Such climate change could have far-reaching and/or unpredictable environmental, social and economic consequences.

The global sea level could rise due to several factors including melting ice and glaciers.

Rising sea levels could damage coastal regions through flooding and erosion. The climate of various regions could change too quickly for many plant and animal species to adjust. Harsh weather conditions, such as heat waves and droughts, could also happen more often and more severely.

Climate change could also affect health and well-being. Many larger cities could experience a significant rise in the number of very hot days. Air pollution problems would increase, placing children, the elderly and people suffering from respiratory problems at greatest risk of health effects. Increases in molds and pollens due to warmer temperatures could also cause respiratory problems such as asthma for some people.

Climate change affects the entire globe. Developed and developing countries are working together to find solutions to climate change. In June 1992, the United Nations Framework

Convention on Climate Change (UNFCCC) was signed by 154 countries that agreed to stabilize the amount of greenhouse gases in the atmosphere at levels that won't cause

harm. In December 1997, in Kyoto, Japan, Canada and 160 industrialized nations committed to reduce their greenhouse gas emissions, as part of an international agreement on climate change called the Kyoto Protocol.

Ghana and Africa will continue to warm, but there are many variables that can affect the speed and magnitude of the changes. Staying informed about climate change, and supporting efforts to slow its progress are things everyone can do.

Taking action on climate change can also make our economy more internationally competitive by creating growth and jobs while producing less waste, pollution and greenhouse gases.

Our climate may already be changing because of the existing build-up of greenhouse gases in the atmosphere, and we **must be prepared** to adapt to those changes.

While action now to reduce emissions is critical, the existing build-up of GHG concentrations means that some climate change in the coming decades is inevitable and planning must start now on adapting our economy and society to these changes.

Adaptation involves taking action to minimize the negative impacts of climate change and taking advantage of new opportunities that may arise. The types of adaptation measures adopted will depend on the impact of climate change on particular regions and economic sectors. Increasing our capacity to adapt reduces our vulnerability to the effects of climate change. However, we must start planning our adaptive responses now; by doing so, we may help to lessen some of the environmental, economic and social costs of climate change.

5.4 AMANSIE WEST DISTRICT

5.4.1 Location and Size

The Amansie West District was carved out of the former Amansie District in 1988. The District shares common boundaries with eight districts namely: Atwima Nwabiagya and Atwima Mponuah to the west, Bekwai Municipality, Amansie Central and Obuasi Municipal to the east, Atwima Kwanwoma to the north and Upper Denkyira and Bibiani to the south. The District serves as a regional boundary between Ashanti Region on one side and Central and Western Region on the other side. Specifically, the district is located within latitude 6.05° West: 6.35° North: 1.40° South and 2.05° East.

The Amansie West District spans an area of about 1,364 square kilometres and it is one of the largest districts in Ashanti forming about 5.4% of the total land area of the Ashanti Region. Manso Nkwanta is the District Capital and it is about 65 km from Kumasi. Other bigger settlements include Atwere, Abore, Adubia Datano, Keniago, Koniase Agroyesum, Ahwerewa, Ankam, Antoakrom, Aponapon, Esaase, Esuowin, Keniago, Mpatuam, Moseaso, Nipankyeremia, Odaho, Pakyi No. 1 and 2 and Watreso.

The surrounding regions and districts with respect to this location provide opportunity for marketing goods and services from the district. The location of the district makes it the gate way to Ashanti from western and central. This has a great potential for promoting hospitality industries such as hotels, restaurants and crafts products. With its vast land area, there is access to agricultural land for the promotion of rice, citronella, cocoa, oranges and oil palm plantations to feed the local agro based industries and beyond.

5.4.2 Relief and Drainage

The topography of the district is generally undulating with an elevation of 210 m above sea level. The most prominent feature is the range of hills, which stretches across the north-western part of the district, especially around Manso-Nkwanta and Abore. These hills have an elevation of between 560 m 630 m. The district is drained in the north by the Offin and Oda rivers and their tributaries such as Jeni, Ahinsu and Emuna. The drainage pattern of the district can be harnessed for irrigational cultivation of rice, vegetable farming and aqua culture.

5.4.3 Climate

The climate of the district is **wet semi-equatorial** climatic. It has a double rainfall maxima regime- with the major rainy season occurring between March and July. The minor rainfall season occurs between September and November. Mean annual rainfall ranges between 855mm and 1,500mm. The average number of rainy days for the year is between 110 and 120 days. The months, December to March are usually dry and characterized by **high temperatures**, and early morning moist/fog and cold weather conditions. Temperatures are generally high throughout the year with mean monthly temperature of about 27°C. Humidity is high during the rainy season. The months of December to February, however, record very low humidity. This climatic condition is suitable for the cultivation of cash and food crops such as cocoa, citronella, oranges, plantain and vegetables to feed the agro based industries in the district and beyond.

It must be stressed however that, current trends in the climatic conditions of the district is becoming unpredictable as a result of climatic change. This has however

affected agricultural planning. The situation calls for measures to reduce the over-reliance on climate for agricultural production like irrigation.

5.4.4 Vegetation

The climatic condition as a result of climate change and global warming is having an advert impact on the vegetation. We should not forget that Ghana depends on climate sensitive sectors such as agriculture to boost our export and sustenance. This serious Earth weather pattern could be seen all over. This has affected the rich vegetation seriously. There is an evidence of inconsistency in the rainy pattern which has affected the production of plantain, cocoa and other cash crops. Debate is seriously joined with respect to both the extent and impact of global warming and how the complex system that determine our climate will respond to changes in the concentrations of GHG in the atmosphere. Temperature is increasing while rainfall is decreasing. The trend has affected the everlasting of water periods as most of the months experience water deficit.

5.4.5 Soil

Soil is one of the “ultimate” resources; like water and air, there are no replacements for soil for growing plants for food and fiber (cotton, pine and red wood trees). According to Donald N, soil is both an ecosystem in itself and part of a larger ecosystem, soil support organisms from microbes to forest trees and humans, and support processes from water storage to waste decomposition.

Soil does so much for human existence. We are able to grow food because of soil availability given to us by God. Nature has made that provision. We get grass and other animal feeds from soil and the life sustainability of soil cannot be override.

Edward J. says that history proves of the role soils have played in our past. The Egyptian civilization of 4,000 years ago, for example was made possible by rich sediments left by the yearly flooding of the Nile River. Soil provides ecosystem services critical for life. Soil acts as a water filter and growing medium, provides habitat for billions of organisms, contributing to biodiversity, supplies most of the antibiotics used to fight diseases. Humans use soil as holding facility for solid waste, filter for wastewater, and foundation for our cities and towns (Soil Science Society of America).

The nice picture taken above of the importance of soil seem threatening due to the impact of the climate change and global warming seriously emerging. Research shows that almost 35% of all greenhouse gases (GHG) released into the atmosphere due to anthropogenic activities since 1850 are linked to land use changes. Crop, grazing, and forest kinds, as well as wetlands, all have potential to reduce crop production. In addition current studies from the International Panel on Climate Change (IPCC) indicate that Earth's surface temperatures could rise by 3.8 to 11.2 degree Fahrenheit over the next 50 years, base on current greenhouse gas (GHG) emissions (Motavalli, 2003). To my knowledge and understanding, this increase in temperature would have profound effects on the soil thereby affecting the production of crops like plantain, rice and other cash crops like cocoa and cotton in the study area. This is so because each crop has a temperature range that is best for the seed to grow, thus, the crop is planted when the soil has warmed enough in the spring for rapid germination. Edward Plaster put it right, soils in the growing regions of the world keep a temperature balance over the year that is satisfactory for the plant growth. Shorter Temperature changes or climatic change between season or night and day, can be dramatic.

5.4.6 Climate Change and Mineral Deposit

The high and the low temperatures have a great impact on the mineral deposits in the area. Recent interdisciplinary studies by the Geological Survey have resulted in substantial progress understanding the influence that climate and hydrology have on the geochemical signatures of mineral deposits and the resulting mine wastes in the Amansie west. Specific areas of focus include the release, transport and fate of acid associated elements from the inactive mines communities like Keniago, Moseaso, Dataano, and Koniase.

The environmental effects of abandoned mines and unmined mineral deposits in the area result from a complex interaction of a variety of chemical and physical factors. This is mostly seen when there is massive rainfall in the area. According to a report, these include the geology of the mineral deposit, the hydrologic setting of the mineral deposit and associated mine wastes, the chemistry of waters interacting with deposits and associated waste material, the engineering of a mine as it relates to the reactivity of mine waste, and climate which affects such factors as temperature and the amounts of precipitation and evaporation.

5.4.7 Climate Change and Lifestock Production

The World Society for the Protection of Animals (WSPA) seeks to create a world where animal welfare matters and animal cruelty ends. In the light of that, the World Society of the Protection of Animals considers that any policy seeking to tackle greenhouse gas (GHG) emissions from agriculture must meet the triple test of being economically viable, ecologically sound and socially acceptable. The researcher saw a serious challenge to the above objective of WSPA because the case is very different in Amansie West. Due to the climatic effect, grasses have dried up giving

farmers a tough time of getting grass for their animals. This challenges from feeding the number of cattle and sheep have been a major worry to the farmers. Their major worry is inadequate farms to grow cattle feed for the animals.

According to WSPA, ongoing damage to the environment is seriously affecting the economic sectors that form the basis of our food supply (fisheries, agriculture, freshwater, forestry) and are a critical source of livelihoods for the poor. Meanwhile the poor form a core part of my studies. The information continues that, already, 60 percent of the world's major ecosystems – from soil, water, forests, and fisheries – on which we depend have been degraded, polluted or used unsustainably. The researcher is not saying that climate change is the planet's biggest threat, affecting land, water availability and crop yields. At a time when populations are rising fast around 6,834, definitely, it is clear that the situation is getting serious. You don't see the impact greatly when you look at it from the size of small land used, it is significant when assessing local impacts, such as biodiversity loss and water or soil pollution.

Many studies confirm that, most climate-related and other environmental impacts of livestock production are closely related to the normal biological functions of animals (food intake, digestion and manure production). Climate change will have far-reaching consequences for dairy and meat production, especially in vulnerable parts of the world where the impact is high.

5.4.8 Impact of Climate Change on Agriculture

Solar radiation, temperature, and precipitation are the main drivers of crop growth; therefore, agriculture has always been highly dependent on climate patterns and variations. Since the industrial revolution, humans have been changing the global

climate by emitting high amounts of greenhouse gases into the atmosphere, resulting in higher global temperatures, affecting hydrological regimes and increasing climatic variability. Climate change is projected to have significant impacts on agricultural conditions, food supply, and food security. The main root and tuber crops grown in Amansie West are cassava, yam and cocoyam. These crops are grown by smallholders for household food. A small quantity is sold to get some money for fish or meat for their meals. A number of farmers complained bitterly because their expectation does not come to pass due to the climate change in the area. According to them the climate change had a great impact on their agricultural products. Climate change leads to degradation of soil and impacts on water resources and subsequently subsistence agriculture, which is largely, practiced by root and tuber crop is always affected. The researcher learnt that impact of the climate change in the area is the main reason why most of the people in communities like Dataano, Moseaso, Koniase will like to go into mining more than farming. Indeed the impact is great

5.5 CLIMATIC IMPACT ON POVERTY

There is a clear example of vicious cycle of poverty and destruction of environment. Understanding and accepting that there is a relationship between poverty and environment will help us to adopt a pragmatic way of combating poverty in Amansie West. Poverty has been identified as the most serious problem facing the people of Amansie with its numerous 'galamsey' activities. This is associated with unsanitary living conditions, hazardous working conditions, lack of access to medical care, and inadequate nutrition.

Indeed, climate change and poverty link a process and a condition that are interrelated. The effects of climate change and global warming will have direct

effects on natural environment, especially on Agriculture. It is serious in the sense that the poor rely heavily on environmental goods and services. Their livelihood depends on Agriculture, fisheries, and forestry, and on the capacity of ecosystem to provide the services vital for environmental balance without which food production and other capacity of ecosystem to provide the services vital for environmental balance without which food production and other productive activities cannot be carried out on a sustainable basis. Specially, the impact of climate change and poverty is one of the greatest areas of human impact and it proposes a burden on people especially living in Amansie West.

Even though there are pockets of people whose living standard is well, the majority of adverse effects of climate change are most experienced by poor and low income communities especially those who are in the interior. Those in poverty have higher chance of experiencing the ill-effects climate change move dramatically due to increase exposure and vulnerability. Vulnerability in the sense that the people find it difficult or unable to cope with adverse effects of climate change. The life of “the poor” reflects the deeper problems of insecurity. According to the United Nations Development Programme, developing countries like Ghana suffer 99% of the casualties attributed to climate change.

The cycle of poverty as I indicated earlier on my submission exacerbates the potential negative impacts of climate change. It is known that some families have become trapped in poverty for at least three generations because they have limited or no access to resources and are disadvantage in means of breaking the cycle.

The researcher will not be far from wrong based on wide readings that in rich countries, coping with climate change has largely been a matter of adjusting thermostats, dealing with longer, hotter summers and observing seasonal shifts, for

those in poverty like Ghana a bad harvest can provide crippling economic shocks. In any case these economic shocks, the widespread famine, drought and potential humanistic shocks affect the people greatly. High levels of poverty and low level of human capacity can push development limit capacity of poor households to manage climate risk.

Another problem due to climate is that during the wet season, rain is excessive and its force leaches out valuable minerals and nutrients from the soil. As if that is the end, the first heavy drops in heavy downpour clog the pores of the soil with fine particles wash from the surface. After few minutes the soil cannot absorb more than a small fraction of the rain to facilitate the growth of crops. Indeed, the poor subsistence farmer suffers from the climatic conditions. With its effects on rainfall, temperature and water availability will affect agriculture in several ways including productivity, agricultural practices, environmental effects and distribution of rural space. It could also worsen the prevalence of hunger through direct negative effects on production and indirect impact on purchasing power. The excessive heat also affects tropical plants. Heat again affects the productivity of the people since it drains people's vitality. These climatic conditions are primary causes of poverty in the study area.

5.6 CLIMATIC IMPACT ON WATER RESOURCES

Authors of the state of the world 1998 suggest that "one of the most underrated issues facing the world as it enters the third millennium is spreading water scarcity" (Brown Flavin, and French 1998). About 40% of the world population faces water shortages at some time during the year (Zwingle 1998). Because 70% of all water pumped from underground or drawn from rivers are used for irrigation, water

scarcity also threatens food supply. Water shortages are exacerbating international conflict. Jordan, Israel, and Syria compete for the waters of the Jordan basin. Jordan's King Hussein declared that water was the only issue that could lead him to declare war on Israel (Mitchell 1998). Especially on the effects of water as the result of climate change, water resources in the Amansie West District are not in a very good state. Most of the streams, rivers and other water bodies are either dried up or polluted with chemicals as a result of galamsey activities in the area.

According to the Obuasi Municipal Development Report all the major streams and rivers like Ahinsu, Atetesu and Aborakese are almost dried up as a result of climate change and other human activities like "galamsey" operators in the communities. It is reflected by the large number of people who have to walk for miles to fetch water especially during the dry season. School children are mainly affected as they get to school late because of the water issue. The reduced rainfall is very serious because most of the farmers in the area as in the country rely on the rain-fed agriculture.

Growing aridity may cause reductions in ground water recharge of between 5-22 percent by the year 2020. Reductions for the year 2050 are projected to between 30 and 40 percent. Apart from the above climate and effects, rivers and the streams in the Amansie West are being polluted by a number of harmful substances, including pesticides acid rain and activities of galamsey operators. This does not happen in Ghana alone, but other areas as well. In 1993, there were more than 9,000 oil spills in around U.S. water alone, totalling more than one and one-half million gallons of spilled oil (Statistical Abstract of the United State, 1998). However, worldwide, more diseases and death are caused by water contaminated from faeces not chemical (Kemp 1998). A lot of communities in the Amansie West like Kaniago, Datano, Koniase and others do not have access to clean water. Where these are not

accessible the communities depend on streams and other water bodies are at risk of water borne diseases. The reason was the poor quality water that is pumped from the bore hole and alleged that the water may have been contaminated with some chemicals underground.

The relative increase in water demand country-wide included Amansie West due to climate change over the scenario without climate change in the same period are 5% and 17% for the year 2020 and 2050 respectively. This climate change in the area has affected Agriculture livestock and living conditions of the peoples in that area. Within the communities, domestic food production is low compared to the needs of the entire area. Climate change has affected the agricultural farm land coupled with mining activities as several farmlands have either been reserved for mining activities or degradation has resulted from the removal of the top soil, trees and vegetation with heavy machines for gold deposits.

5.7 CLIMATIC IMPACT ON HEALTH

Weather and climate play a significant role in people's health. Changes in climate affect the average weather conditions that we are accustomed to. Warmer average temperatures will likely lead to hotter days and more frequent and longer heat waves. This could increase the number of heat-related illnesses and deaths. Increases in the frequency or severity of extreme weather events such as storms could increase the risk of dangerous flooding, high winds, and other direct threats to people and property. Warmer temperatures could increase the concentrations of unhealthy air and water pollutants. Changes in temperature, precipitation patterns, and extreme events could enhance the spread of some diseases. It is evident that streams and rivers like Ahinsu, Atetesu and Aborakese where these chemicals and toxic materials

drain into serve the villages and towns along them. Consequently, their drinking water is poisoned causing a lot of health related diseases.

The impacts of climate change on health will depend on many factors. These factors include the effectiveness of a community's public health and safety systems to address or prepare for the risk and the behaviour, age, gender, and economic status of individuals affected. Impacts will likely vary by region, the sensitivity of populations, the extent and length of exposure to climate change impacts, and society's ability to adapt to change.

Although Ghana has well-developed public health systems compared with those of many developing countries like Togo, Benin and Liberia, climate change still affects many regions and communities in the country. There are 4 hospitals within the municipality. Obuasi Government Hospital, Bryant Mission Hospital, AngloGold, Ashanti Hospital, and St Jude Hospital. There are also 6 clinics which complement the services of the hospital. The rest consist of health post. The hospitals serve as a referred centres for other institutions at the lower level. The impacts of climate change on public health around Obuasi could have important consequences for the communities like Koniase, Datano and others in the Amansie West. For example, more frequent and intense storms may require more disaster relief and declines in agriculture may increase food shortage.

5.8 OTHER HEATH LINKAGES

Other linkages exist between climate change and human health. For example, changes in temperature and precipitation, as well as droughts and floods, will likely affect agricultural yields and production. In some regions of the world, these impacts may compromise food security and threaten human health through malnutrition, the

spread of infectious diseases, and food poisoning. The worst of these effects are projected to occur in developing countries; among vulnerable populations. Declines in human health in other countries might affect the United States through trade, migration and immigration and have implications for national security. Although the impacts of climate change have the potential to affect human health in the United States and around the world, there is a lot we can do to prepare for and adapt to these changes. Learn about how we can adapt to climate impact on health.

KNUST



CHAPTER SIX

FIELD FINDINGS

6.1 INTRODUCTION

Issues relating to climate change, biodiversity destruction, natural resource extraction and environmental justice have caught up with us and become too important to be ignored. The high temperatures and phenomenal weather changes that we are experiencing in Ghana have turned what was previously regarded as abstract global issues into real life experiences. God reminds us in Leviticus 25:23-24 that “The land is mine and you are but aliens and my tenants. Throughout the country that you hold as a possession you must provide for the redemption of the land”.

According to Owusu-Koranteng (2010), the life of Jesus Christ abounds with many examples to demonstrate the need to use the gospel to meet the spiritual and material needs of humanity. The Holistic Ministry does not distinguish between spirituality which draws Christians to the saving relationship with Christ and the “Social Ministry” which involves social actions by Christians to give practical meaning to the love and care for God’s creation. The Holistic Ministry is the belief in one gospel which brings salvation in its fullest sense including salvation from sin, hunger, poverty, environmental degradation, human rights abuses etc. The grave social, economic and environmental problems facing the world show that human beings have violated the laws of nature with impunity and woefully failed to protect God’s creation. Greedy consumption patterns have goaded us to abuse nature. We have not exercised responsible management of God’s creation. Unfortunately, we seem not to be learning any useful lessons that the problems confronting the world had resulted from the mistake in not considering the environment as the basis for the survival of

humanity but had placed economic and financial considerations above environment issues. We are destroying the basis of our lives for a pittance and not taking counsel from the Biblical statement that it is unprofitable to gain the whole world and lose one's soul.

6.2 METHODOLOGY

The main objective of the study was to examine the Christian attitude towards the environment and vicious cycle of poverty. In response to our objective primary and secondary data were adopted for the study. The primary data was collected primarily through interviews and questionnaire. Officials of EPA, mining companies and galamsey operators were interviewed. Questionnaires were also administered to church members.

Officials of EPA were interviewed to assess the factors that causes environmental degradation and the strategies put in place by the agency in tackling environmental degradation. Interview was also conducted on mining companies to assess how the operations of the mining companies affect the environment and also how mining companies relate with the communities in which they operate. Adanse Mining Company was the mining company selected.

Galamsey operators were also interviewed to find out how they perceive their operations on the environment and also their relationship with the communities in which they operate. Areas visited concerning galamsey operations included Manso Keniago, Manso Takorase, Manso Koninase and Manso Datano. Members of communities affected by the operations of mining activities were also interviewed.

The interview with the communities affected by the operations of the mining companies sought to assess how the operations of the mining activities affect those communities and also to find out if the communities were informed by the mining/galamsey operators when their activities are likely to affect the community. The communities visited were Manso Keniago, Manso Takorase, Manso Koninase and Manso Datano.

Questionnaires were also administered to church members to assess how they perceive environmental degradation, and the efforts of their churches in tackling environmental degradation. The congregations that answered the questions included the Catholic Church, Seventh Day Adventist Church, Methodist Church, Church of Christ, Assemblies of God, Baptist, Presbyterian and Pentecost Churches. Secondary data were obtained from books, journals, reports in the libraries and the internet which are well related to the topic under discourse.

6.3 THE FOLLOWING ARE THE OBJECTIVES THE FINDINGS SEEK

FOR:

- To examine the effect of environmental degradation and vicious cycle of poverty in Ghana
- To explore the factors causing environmental degradation and vicious cycle of poverty
- To examine Churches' perception on environmental degradation and vicious cycle of poverty
- To identify the effects of environmental degradation on humankind

- To investigate the challenges faced by the churches in managing the degraded environment and vicious cycle of poverty

6.4 RESEARCH FINDINGS

6.4.1 Environmental degradation and vicious cycle of poverty in Ghana

With the issue of environmental degradation and vicious cycle of poverty in Ghana, responses were gathered from both interviews and questionnaires administered to respondents. Bruce Kyei, The Chief Executive officer of ‘Friends of the Earth’, a Non-Governmental organization, indicated that Governments both past and present have shown gross disregard for important policies of the country that safeguard and protect the environment. He stated that mining in forest reserves contravenes certain provisions in the National Land Policy developed by the Ministry of Lands and Forestry in 1999. Section 4.5(a) of the National Land Policy states that, “To ensure the conservation of environmental quality, no land with primary forest cover will be cleared for the purpose of establishing a forest or tree crop plantation or mining activity”. The National Land Policy of 1999 states further in Section 4.4(b) that, “All lands declared as forest reserves, strict nature reserves, national parks, wildlife sanctuaries and similar land categories constitute Ghana’s permanent forest reserves and wildlife estates, and are ‘fully protected’ for ecosystem maintenance, biodiversity conservation and sustainable timber production”.

He emphasized that contrary to those provisions indicated above; Newmont Ghana Gold Limited was granted a Mining Lease for its Akyem project which would establish a pit in the Ajenua Bepo Forest Reserve, a Forest Reserve of biodiversity importance. Whilst the company and government justifies mining in Ajenua Bepo

Forest Reserve with the statement that the forest reserve is already depleted and the company would grow trees somewhere to mitigate the biodiversity destruction, the farmers in the area contend that the Ajenua Bepo Forest Reserve promotes rainfall and agriculture in the area and also serves as the watershed for many rivers. Companies such as Chirano Gold Limited and AngloGold Ashanti have been permitted to mine in Tano Suraw and Kubi forest reserves respectively.

Nyame Festus, a member of the Pentecostal International Worship Center (PIWC), a branch of the Pentecost Church at Asokwa, stated that biodiversity which demonstrates God's magnificence is definitely more beneficial and complicated than tree plantations and that we **should not destroy** biodiversity and counteract it by saying that by replanting we could bring it back to its former form.

To a Pastor of the International Charismatic Church, Reverend Atta Mensah, the forest reserves in Ghana are sitting on minerals and have thus become targets by greedy mining companies and one **economic reason** or the other had been given for the destruction of the forest reserves to pave way for mining. He indicated that NGOs, Faith based organisations and advocacy NGOs that had raised their voices against the wanton destruction of God's creation have been tagged as being against development.

Omanhene Kwaku Boateng, the Programmes Officer of the Environmental Protection Agency (EPA) stated that cost-benefit analysis that factors in economic, social and environmental cost associated with surface mining would reveal that streams of revenues from mining cannot address the problems of water pollution,

human rights abuses, displacement of people, low compensation payments etc. The contribution of mining to Gross Domestic Product of Ghana is about 5% and yet we are prepared to allow the pollution of our rivers, destruction of forest reserves, payment of compensation as low as one off payment of 5-9 Ghana Cedis for a cocoa tree that can earn a farmer at least 15-40 Ghana Cedis for a cocoa tree per year for almost 60 years in addition to scholarships and other perquisites.

Isaac Boakye, a Roman Catholic Priest from St. Peters Catholic Church, stated that God in his wisdom blesses a nation with minerals for the benefit of present and future generations but when misused, leads to what is normally described as resource curse. It is a paradox of plenty for Ghana with its mineral endowment to be described as a poor country with a cup in hand always seeking grants and loans to support national budgets when mineral revenues are beyond \$2 billion. He stated further that God is giving us a new opportunity in oil and that if we don't manage it well, it could be like gold mining.

6.4.2 Factors causing Environmental Degradation and Vicious Cycle of Poverty

On the issue of factors that cause environmental degradation and vicious cycle of poverty, The Programmes Officer of the Environmental Protection Agency (EPA) indicated that as the people become poorer, they destroy the resources faster. They tend to overuse the natural resources because they don't have anything to eat or any means of getting money except through the natural resources. Poor people, he emphasized, harvest natural resources for their survival or in order to meet their basic needs such as firewood, agricultural productions, and water and wild plants for

their medicine. He stated that all people regardless of being poor or rich depend on natural resources; the concern with poor people is that they are utilizing the resources directly. To him, the rich people do depend on these resource but they do not go to the forest directly and harvest the resources.

David Barnes, the Assistant Programmes Officer of EPA on the other hand stated that due to the lack of sufficient income people start to use and overuse every resource available to them when their survival is at stake. As desperate hunger leads to desperate strategies for survival, many trees are harvested for fire wood, timber and art craft. Most of the poor people use this fire wood as their source of income by selling them, and art craft products are also used for income generation. The roots of the trees are dug out for medicinal purpose. This leaves the soil exposed as the grasses are also grazed by animals and also collected for roofing the houses. When it rains the entire top and good soil is eroded which makes it difficult for that soil to produce better agricultural products.

Reverend Ministers also added their voice on the issue of factors that cause environmental degradation and vicious cycle of poverty. Justice Appiah Kubi, a Reverend Minister from the Grace Baptist Church, Amakom, stated that poor people often lack sufficient income and education to afford higher quality life where they can use electricity and also buy electric appliances to ease their domestic life. He advised that instead of cutting trees for fire wood they can use electric stoves for cooking. Electricity can also slow down the firewood business as most people will no longer be relying on firewood as it takes time to prepare the fire using wood than just switching on the electricity. The use of electricity will make their lives simpler because it will save time and that they would not have to go to the field to fetch

wood. To him the chances of been bitten by a snake or getting injured are high when they are in the field.

The Community Relations Officer of Adanse Mining Company in Manso Nkran in the Amansie West District, Mr Osei Hwere, indicated that poor people have no quality drinking water as they pollute the rivers by washing inside them and by also using a river as a dumping site for the bins. He stated that lack of education also prohibits them from practicing environmentally sustainable agriculture; protect natural resources against degradation or rehabilitate degraded resources like rivers. The Relations Officer indicated that in the areas that his company operates he has observed that the rural people easily die due to environment-related diseases. These diseases he indicated includes acute respiratory infection linked to indoors and outdoor air pollution, diarrhoea caused by lack of clean water and sanitation and also cholera, malaria and asthma.

An Assembly man from Manso Datano, Kwaku Agyei, whose community has been gravely affected by galamsey operations, indicated that in their quest for food security, the rural poor have sometimes little choice but to overuse the limited resources available to them. The resulting environmental degradation imposes further constraints on their livelihood in what has been called a "downward spiral" or "vicious circle". They are often forced to make trade-offs between immediate household food requirements and environmental sustainability both in production and consumption. He further stressed that their lack of assets, and that of property rights, limited access to financial services, and lack of participation in decision-making can result in their adopting strategies that favour immediate imperatives over longer-term objectives. This can result in adopting strategies that rely on the drawing down of the capital available to them -- mainly in the form of natural resources. It

also makes them more vulnerable to environmental degradation, including degradation wrought by others than the poor themselves.

An inhabitant of the Manso area, Kwasi Brefo, who happened to be a staff of Adanse Mining Co. Ltd indicated that, to him the poor may be both agents and victims of environmental degradation, especially in marginal areas, where the resource base is ill-suited to agriculture. But it cannot be assumed that the poor have an intrinsic propensity to degrade environmental resources. On the contrary, many poor traditional communities demonstrate an admirable environmental ethic and have developed complex resource management regimes. There is little evidence that the rural poor, when offered an appropriate environment - including secure tenure and access to markets- pursue resource-degrading strategies. Thus, while poverty may be an underlying cause of environmental degradation, it is more accurately seen as a proximate cause influenced by a complex of policy and institutional factors. He was of the view that the very same processes that lead to and perpetuate poverty constrain the poor in their decision- making with regard to natural resource management.

The respondents from Manso Koniase and Manso Datano which were communities affected by mining activities indicated that since farming alone cannot provide sufficient means of survival, and since most of their lands have been taken away for mining activities, they generally rely on a wide variety of on and off-farm activities and income sources. Many of these are based on natural resources. They include activities such as illegally felling of trees for preparing charcoal which further degrades the environment.

6.4.3 Churches perception on Environmental Degradation and Vicious Cycle of Poverty

On the issue of churches perception on environmental degradation and vicious cycle of poverty, a pastor from the Baptist church, Pastor Justice Appiah Kubi indicated that, he always keeps his message about the earth consistent with other messages. He emphasized that he loves the earth not as an issue in itself, but he sees it as one thing of many that the creator designed.

Mrs. Monica Brako, Assistant Headmistress of Osei Tutu Secondary School, and a Reverend Minister with the Methodist Church indicated that she may not be a typical environmentalist in the modern secular sense. For her the green issue seems to be more about being a steward to God's creation. Speaking to her congregation, she always stresses that taking care of the earth speaks directly to protecting what the Bible says was created in Genesis. She also made a connection between how a greener lifestyle falls within the human responsibility to protect the world's poorest communities, which are often the first to feel a changing climate ecological effects such as floods or droughts, which can cause conflicts over resources. He emphasized that pastors are expected to use the pulpit to underscore climate change effect on global resources and, in effect, what an unstable ecosystem could mean for the future of world balance and peace.

The Reverend indicated further that she values human life above anything else, and claimed that "humans are the only one of all creatures on this earth that can establish a free and conscious relationship with his creator." In other words, says the reverend Minister, she is unlikely to back environmental solutions that focus on reducing the human population or limiting the use of the earth's resources to support human livelihood.

A Priest of the Catholic Church, Isaac Boakye, indicated that he uses Roman Catholic doctrine to emphasize humanity's responsibility to care for the planet. He indicated that the Catholic Church announced seven new sins that require repentance. Number four on the list was "polluting the environment." Among the others were "causing social injustice" and "becoming obscenely wealthy," which are also both linked to taking care of the earth. He described environmental concerns as a "moral issue" and stated that people have "a grave responsibility to preserve the earth's order for the well-being of future generations." He urged Priests to make 'green' a central part of their teachings and policy-making. He called on Catholics to be better stewards of God's creation and further emphasized that global citizens have to "focus on the needs of sustainable development."

6.4.4 Effects of environmental degradation on humankind

On the issue of the effects of environmental degradation on human kind the officers of the Environmental Protection Agency (EPA) who were interviewed responded that the degradation of the environment has a devastating effect on humankind. The Programmes Officer of The Environmental Protection Agency (EPA) laid more emphasis on soil exhaustion and stated that soil exhaustion occurs when certain nutrients are taken from the soil but are not replenished naturally or artificially with fertilizers. He stressed that a homogenous crop, usually a cash crop, grown repeatedly on the same piece of land can lead to soil exhaustion. He emphasized that increasing population's pressures on land can also lead to shortened fallow periods and this coupled with the farmer's inability to apply variable inputs more intensively because of poverty, can lead to decreased soil productivity.

The Programmes Officer further indicated that degradation of land and loss of its vegetative cover also have consequences at the global level, primarily because of its influence on carbon exchange, but also in terms of loss of biodiversity. The large amount of carbon stored in the vegetation of the dry zones, for example, averaging about 30 tonnes per hectare, decreases when the vegetation is depleted or disappears. Carbon-rich soils, frequently found in dry zones, store a substantial amount of this element. The destruction of these soils has a very powerful effect on the carbon cycle and boosts the greenhouse effect as a result of the release of carbon.

The Assistant Programmes Officer also indicated that the most debilitating risk is that of drought. He indicated that the combination of poverty and drought can have serious environmental consequences that threaten future agricultural productivity and the conservation of natural resources. Poor people are induced to scavenge more intensively during droughts, seeking out wood and other organic fuels, wild life and edible plants, both to eat and to sell. This scavenging aggravates deforestation and causes damage to watersheds and soil already under stress from the drought. The problem is aggravated in common property pastoral farming where farmers carrying extra cattle as insurance against drought may exploit and over burden the carrying capacity of the land increasing the likelihood of permanent damage. Over grazing by large herds of cattle, sheep and goat could damage the environment.

The Community Relations Officer of Adanse Mining Company indicated that to him, the communities in which the mining companies operate are really affected by the operations of the mining companies. He stated that maintaining year round access to safe abundant supplies of water was a significant problem for communities affected by mining activities since their waters are polluted by the activities of the mining companies. He emphasized further that the poor generally have access only to areas

that have higher risk for health and income generation, and they generally lack the resources to reduce the exposure to the risk or to invest in alleviating the causes of such risk. Environmental degradation, he stated, can affect the health and nutrition status of the poor and lower their productivity. This can happen both directly through, for example, lower yields per unit of labour or land because of reduced soil quality, and indirectly through the reduced physical capacity of labour to produce because of malnutrition and poor health. Even in cases where the poor are healthy labour productivity can be low due to increased time being allocated to less-productive activities such as fuel wood collection and away from agriculture and other income generating activities.

About ninety percent of the respondents from Manso Takorase, who had been affected by galamsey operations, indicated that the degrading of the environment has had harmful effects on their lives. In many cases the respondents from the Manso area indicated that the communities are denied access to good drinking water due to mining operations. The problems of environmental degradation and water availability has also meant that in some areas, affected communities rely to a great extent, particularly in the dry season, on water sources that are increasingly polluted by chemicals from mining operations.

Kofi Nyame, an officer of 'Friends of the Earth', a locally based Non-Governmental Organization (NGO) in Manso Keniago, indicated that the activities of galamsey operators have had grave environmental effect on the members of the Keniago community. He indicated that most of their lands have been taken away by the so called 'legally operating galamsey companies'. These have tended to make the inhabitants of the Keniago area very poor. He was of the view that, in terms of the productivity of the resources that the poor manage the decline is intricately related to

the poverty-population-environment interaction. He emphasized that where the poor depend on biomass fuel and confront increasing fuel wood scarcity they often shift to using animal dung, fodder and crop residues for fuel. To him, poverty forces a trade-off between the immediate demands for fuel for cooking and heating and manure for the land. The time-preference argument suggests that the immediate and urgent needs be satisfied.

6.4.5 Challenges faced by the Churches in Managing the Degraded Environment and Vicious Cycle of Poverty

On the issue of the challenges faced by churches in managing the degraded environment and vicious cycle of poverty, responses were gathered from Reverend Ministers from the various denominations visited. Almost all the respondents indicated that there are challenges faced by the churches in managing the degraded environment and vicious cycle of poverty. Reverend Father Francis Tetteh Buer, Parish Priest of St. Andrews Anglican Church, Kwamo, indicated that those challenges have been exacerbated by the fact that politicians have been voted to power not on the basis of how they would protect our already destroyed environment but by their development programmes whether these so-called development programmes would worsen environmental destruction or not. In the end, we have not had development in its true sense but for certain, we have ended up exacerbating environmental destruction. He indicated further that all the major political parties in Ghana do not have firm commitments on how to address the rate of environmental destruction of this country in their Manifestoes because of a marriage of convenience that exist between politicians and polluting companies.

He emphasized that Party Manifestoes are mostly decorated with few sentences on the environment, and made mention of the fact that the role of multinational companies in the pollution of the environment cannot be ruled out. He was of the view that those multinationals have huge investments in the country and most of the time, they finance political parties, making them unable to delve into the activities of these multinational companies to be able to know how their activities have been harmful to the environment.

One of the respondents under priesthood training at the Trinity Theological Seminary, Accra, Asenso Michael, stated that “The Earth is not dying - it is being killed”. He emphasized that some of the big multinational companies are contributing to the killing of the Earth. It is these same polluting multinational companies that fund political parties and as such dictate who should be our political leaders. Politicians end up dealing with the polluting companies with kid gloves because there is a mutual understanding that “you don’t cut the hand that feeds you”.

A Reverend Minister with The Presbyterian Church of Ghana, Reverend Ntiamoah Mensah, of Nsuta Kwamang, also indicated that one of the challenges he perceives is that most of the time open access resources are not controlled by any user and are thus open to all. In Ghana, although the state is the formal owner of resources, such as forests or wetlands, the responsible authorities have been unable or unwilling to enforce this ownership. Thus the resources have often become de facto open access. This has led to rapid exploitation and depletion, as users maximize their short-term gain from the insecure and often illegal access to the resource. He was of the view that private concessionaires with close links to the state are often responsible for this rapid exploitation.

The church members were also asked to give their views on the challenges faced by churches in managing the degraded environment and vicious cycle of poverty. About ninety percent of the respondents were of the view that the church has challenges in the managing of the degraded environment. A respondent from the Seventh Day Adventist Church at Amakom, a suburb of Kumasi indicated that to him churches do not have the expertise in environmental issues. He also stated that funds for embarking on major environmental awareness in communities affected by environmental degradation is also not available to most churches. He went on to recommend that the churches should liaise with environmental friendly organization to organize seminars for the ministers of the various denominations so that they would be abreast of environmental issues and also be able to advise their congregations accordingly.

6.5 DATA ANALYSES

This section analysis data gathered on the field.

6.5.1 Effects of Mining Activities on Inhabitants

Maintaining year round access to safe abundant supplies of water was a significant problem for communities affected by mining activities. In many cases the respondents from Manso area indicated that the communities are denied access to good drinking water due to mining operations. The problems of environmental degradation and water availability has also meant that in some areas, affected communities rely to a great extent, particularly in the dry season, on water sources that are increasingly polluted by chemicals from mining operations.

Some respondents from the communities affected by mining activities indicated that since farming alone cannot provide sufficient means of survival, since most of their lands have been taken away for mining activities, they generally rely on a wide variety of on and off-farm activities and income sources. Many of these are based on natural resources. They include activities such as illegally felling of trees for preparing charcoal which further degrades the environment

6.5.2 Effects of Poverty on the Environment

As people become poorer, they destroy the resources faster. They tend to overuse the natural resources because they don't have anything to eat or any means of getting money except through the natural resources, they start to depend more on natural resources. Poor people harvest natural resources for their survival or in order to meet their basic needs such as firewood, agricultural productions, and water and wild plants for their medicine. All people regardless of being poor or rich depend on natural resources; the concern with poor people is that they are utilizing the resources directly. The rich people do depend on these resource but they do not go to the forest directly and harvest the resources.

Due to the lack of sufficient income people start to use and overuse every resource available to them when their survival is at stake. As desperate hunger leads to desperate strategies for survival, many trees are harvested for fire wood, timber and art craft. Most of the poor people use this fire wood as their source of income by selling them. The roots of the trees are dug out for medicinal purpose. This leaves the soil exposed as the grasses are also grazed by animals and also collected for roofing the houses. When it rains the entire top and good soil are eroded which makes it difficult for that soil to produce better agricultural products.

Poor people often lack sufficient income and education to afford higher quality life where they can use electricity and also buy electric appliances to ease their domestic life. Instead of cutting trees for fire wood they can use electric stoves for cooking. They can also use electric heaters to warm themselves during winter month. Electricity can also slow down the firewood business as most people will no longer be relying on firewood as it takes time to prepare the fire using wood than just switching on the electricity. The use of electricity will make their lives simpler because it will save time, they won't go to the field to fetch wood.

Poor people have no quality drinking water as they pollute the rivers by washing inside them and by also using a river as a dumping the bins. The lack of education also prohibits them from practising environmentally sustainable agricultuerer; protect natural resources against degradation or rehabilitate degraded resources like rivers.

In the poorest regions it is estimated that one in five children will not live to see the fifth birthday due to environment-related diseases. Statistics show that almost four million children are dying each year because of acute respiratory infection linked to indoors and out-door air pollution. Other environment-related diseases killing the children are diarrhoea caused by lack of clean water and sanitation and also cholera, malaria and asthma.

In their quest for food security, the rural poor have sometimes little choice but to overuse the limited resources available to them. The resulting environmental degradation imposes further constraints on their livelihood. They are often forced to make trade-offs between immediate household food requirements and environmental

sustainability both in production and consumption. Their negligible man-made capital assets, ill-defined or non-existent property rights, limited access to financial services and other markets, inadequate safety nets in time of stress or disaster, and lack of participation in decision-making can result in their adopting mechanisms, which favour immediate imperatives over longer-term objectives. This can result in coping strategies that rely on the drawing down of the capital available to them -- mainly in the form of natural resources. It also makes them more vulnerable to environmental degradation, including degradation wrought by others than the poor themselves.

6.5.3 The Church and Environmental Degradation

It was realized from the responses gathered that the voice of the church had not been as strong as expected of people whose faith demands that they protect nature as God instructed us in Genesis 2:15, to cultivate and care for God's creation. Article 41 of the 1992 Constitution of Ghana states that it is the duty of every citizen to "protect and safeguard the environment". The landmark report of the World Commission on Environment and Development, entitled "Our Common Future", warned that unless we change many of our lifestyle patterns, the world will face unacceptable levels of environmental damage and human suffering (Owusu-Koranteng, 2010). The Commission, echoing the urgent need for tailoring the pace and the pattern of global economic growth to the planet's carrying capacity, said that: "Humanity has the ability to make development sustainable and to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs"(Owusu-Koranteng, 2010).

From the responses gathered, a pastor indicated that, he believes that environmental consciousness should be seen as a link to the doctrine of Christ and social teachings, most of all the value of life. A reverend minister with the Methodist Church also indicated that, for him the green issue seems to be more about being a steward to God's creation. Speaking to his congregation, he always stresses that taking care of the earth speaks directly to protecting what the Bible says was created in Genesis. He also made a connection between how a greener lifestyle falls within the human responsibility to protect the world's poorest communities, which are often the first to feel a changing climate's ecological effects, such as floods or droughts, which can cause conflicts over resources. He emphasized that pastors are expected to use the pulpit to underscore climate change's effect on global resources and, in effect, what an unstable ecosystem could mean for the future of world balance and peace. The Reverend indicated further that he valued human life above anything else, and claimed that humans are "the only one of all creatures on this earth that can establish a free and conscious relationship with his creator." In other words, says the pastor, he is unlikely to back environmental solutions that focus on reducing the human population or limiting the use of the earth's resources to support human livelihood.

6.5.4 The Effect of Poverty on Health

It was realized that the poor generally have access only to areas that have higher risk for health and income generation, and they generally lack the resources to reduce the exposure to the risk or to invest in alleviating the causes of such risk (Owusu-Koranteng, 2010). Environmental degradation, therefore, can affect the health and nutrition status of the poor and lower their productivity. This can happen both directly through, for example, lower yields per unit of labour or land because of

reduced soil quality, and indirectly through the reduced physical capacity of labour to produce because of malnutrition and poor health. Even in cases where the poor are healthy labour productivity can be low due to increased time being allocated to less-productive activities such as fuel wood collection from agriculture and other income generating activities.

In terms of the productivity of the resources that the poor manage, the decline is intricately related to the poverty-population-environment interaction. Where the poor depend on biomass fuel and confront increasing fuel wood scarcity they often shift to using animal dung, fodder and crop residues for fuel. The quantities of these materials that are returned to the soil are thus reduced and its fertility declines. Non-replenishment of soil nutrients leads to soil exhaustion as fuel wood supplies diminish and animal manure is increasingly used as a fuel substitute. Poverty forces a trade-off between the immediate demands for fuel for cooking and heating and manure for the land. The time-preference argument suggests that the immediate and urgent needs be satisfied.

The poor may be both agents and victims of environmental degradation, especially in marginal areas, where the resource base is ill-suited to agriculture. But it cannot be assumed that the poor have an intrinsic propensity to degrade environmental resources. On the contrary, many poor traditional communities demonstrate an admirable environmental ethic and have developed complex resource management regimes. There is little evidence that the rural poor, when offered an appropriate environment - including secure tenure and access to markets- pursue resource-degrading strategies. Thus, while poverty may be an underlying cause of environmental degradation, it is more accurately seen as a proximate cause influenced by a complex of policy and institutional factors. The very same processes

that lead to and perpetuate poverty constrain the poor in their decision- making with regard to natural resource management.

6.6 INTERPRETATION OF RESPONSES

As have been critically examined, environmental degradation is a problem affecting not only the mining areas but Ghana as a whole and efforts should be made to reverse the trend. Government has been in the forefront of taking up environmental preservation and management activities in mining areas. NGO's are also involved in this exercise of preservation. There, however remains a lot more to be done. This calls for more stakeholders and concerned groups to be responsible and take up the task of preservation activities to help reverse the trend of environmental degradation in the mining areas and Ghana as a whole. There are growing concerns of the need for the church to embark on environmental preservation campaigns as a response to her call. This is because the church in Ghana has been deemed one of the potential institutions to be concerned with environmental conservation activities, due to its unique position. Again the church is found in every rural community and so its involvement in environmental conservation activities will help reverse the trend of environmental degradation in Ghana.

6.6.1 What the Churches can offer

Over the past two decades, environmental degradation, including land degradation has continued to worsen, exacerbating further poverty and food insecurity. Conversely, awareness of the importance of the environment and its conservation has increased. There has been a transformation in people's perception of the poverty problem in developing countries. If one accepts that hard core rural poverty is

increasingly a phenomenon associated with marginal lands, then new strategies are required that integrate poverty alleviation and environmental management. Until recently, the international community and national governments have tended not to appreciate the need for integrated rural poverty alleviation and environmental management programmes in marginal areas. There have been a number of promising initiatives in this field, usually undertaken by NGOs and community-based organizations, but they were usually small and much localized. At the same time, in many regions, rural people's perceptions of their environment and the priority they give to a better relationship with it have changed. It is recommended that, the churches should preach and educate its congregation that the fragile environment on which they depend for their survival is being neglected or over-exploited, and it is now necessary to rehabilitate it and manage it sustainably. Churches should also teach its members that the environment belongs primarily to them, and they must take the responsibility for the land and organize themselves in groups, cooperatives, development associations and local associations to defend it.

The Church has its own challenges and limitations. The church is a heterogeneous community and in most cases, the very key people who have been part of the problems of the environmental crisis of the country are influential and respected people of the Christian community. Once their bread gets buttered by managing institutions and companies that profit from the environmental problems of our country, these agents of multinational companies would stop at nothing in ensuring that the church does not join the growing forces against the forces of greed and destruction. According to Owusu-Koranteng (2010), the Church needs to rise above the dictates of men and women in order to fulfil its prophetic mission of full spiritual

and environmental salvation. The Church has no option than to state a strong position against the destruction of the environment and the exploitation of our natural wealth which ends up impoverishing our people. The Church has to hearken to the call to protect God's creation.

There is a need to step up efforts aimed at awareness-building. This is a task for which churches are best suited. Churches should give a high priority to this objective when designing their theological materials for teaching. There is also the need for churches to promote a Christian Fund and similar mechanisms for directing funds to environmental awareness projects.

6.7 RECOMMENDATIONS

After a thorough and meticulous study and analysis of the problem, there is the need to step up efforts aimed at awareness-building. The following recommendations are made to address the problems raised above:

- a) The Environmental Management Department in the Amansie West District should revise its environmental management policy to ensure that the environmental effects of "galamsey" activities in the area are reduced to the barest minimum, especially communities like Detaano, Koniase, and Aboe.
- b) Stringent and rigorous efforts at re-forestation, resettlement of affected communities and other measures aimed at helping communities that are affected and also help restore back degraded lands to its original state after "galamsey" activities. The District should provide alternative jobs that can help sustain the people in the communities.
- c) Individual communities and households in the communities should be educated on the need to use mosquito nets in their rooms to avoid malaria

infections through biting by mosquitoes. They should also be educated on the changes of environmental degradation and its numerous effects.

- d) The Church should also take it upon themselves and educate their members the alternative ways of gathering income than always depending on the environment for their livelihood.
- e) Last but not the least, there is the need for an effective collaboration and co-ordination among governmental agencies such as E.P.A., N.G.O's, the Ghana Minerals Commission, the Forestry Commission and others so that they can perform their roles affecting in dealing with the environmental and health problems associated with “galamsey” activities within the affected communities.

6.8 CONCLUSION

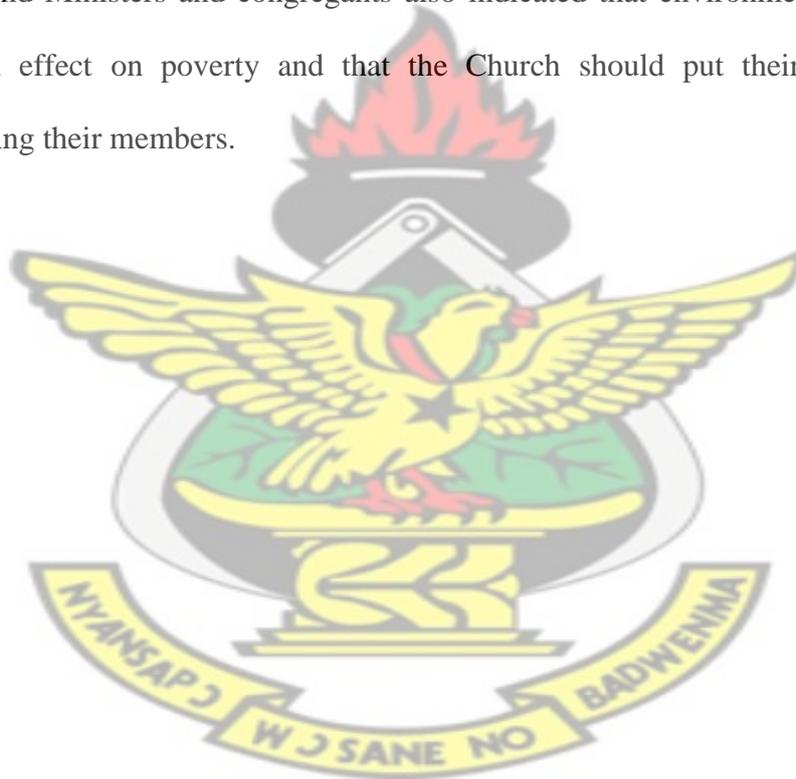
In as much as we acknowledge from the responses gathered that environmental degradation is a serious issue that should not be taken lightly. There is the need to recognised the environmental degradation and vicious cycle of poverty that come with it in order to find ways of dealing with them.

After a thorough investigation into the problem as pertains in the Churches, some individual and some communities in Amansie West, it was realised that the operations of mining and “galamsey” activities have gravely affected them.

There is also incidence of pollution of varied kinds (that is air, noise and water) to the environment. Water pollution has affected mainly water resources within the area. All of the major streams and rivers in the area like Jeni, Ahinsu, Kwabrafo, Nyam and Emuna have been polluted by "galamsey" activities.

The combined effects of above raised issues have culminated into health problems with high prevalence of disease such as malaria, respiratory tract infections and skin diseases endemic in the area. These were seen as the indirect effects of "galamsey" activities on food production in the area. The respondents indicated that most of their lands cannot be farmed because of the mining activities. It was also clear that climate change and global warming affects both humans and animals alike. Global warming is great and is gradually being experienced in many parts of the country particularly in Amansie West causing streams to dry up.

Reverend Ministers and congregants also indicated that environmental degradation has an effect on poverty and that the Church should put their resources into educating their members.



BIBLIOGRAPHY

Adarkwa-Dadzie, Alice (2001) *Nature Kicks Back*, Accra: Advent Press.

Adow, Obeng Emmanuel and Getui Mary N (1993) *Theology of Reconstruction*, Nairobi: Action Publishers.

Agarwal, B. (1997) Gender, Environmental, and Poverty Interlinks: Regional Variations and Temporal Shifts in Rural India, 1971-91. *World Development* 25(1): 23-52

Agbeti, J. Kofi (1986) *West African Church History*, Leiden: E.J. Brill Agroforestry Manual for Farmer's Decision Support in Northern Communities of Ghana (2004) prepared by Ghana – Canada in Concert Programme.

Anderson, Kerby (2005) *Christian Ethics in Plain Language*, Nashville: Thomas Nelson Inc.

Andoh, R.N (1999) "Arbor Week: A Response to Environmental Care. Ghana; St. Francis Press Ltd.

Asante, M.S (2005) *Deforestation in Ghana: Explaining the Chronic Failure of Forest Preservation Policies in a Developing Country*, Maryland: University Press of America

Asante, Emmanuel (2001) He who Possesses the Land Possesses Divinity Spirituality and Land from Biblical and African Perspectives, *Trinity Journal of Church and Theology*, Volume XI, January/July 2001, Number 1 & 2.

Asante, Emmanuel *Ecological Crisis: A Christian Answer*, *Trinity Journal of Church and Theology*, Volume IV, December/January 1994-95, number 2.

Asante, Emmanuel (1999) *Stewardship: Essays on Ethics of Stewardship*, Accra: Wilas Press Ltd.

Asante, Emmanuel (1995) *Toward on African Christian Theology of the Kingdom of God: The Kingship of Onyame*, Lewiston: The Edwin Mellen Press.

Attfield, R (1991) *The Ethics of Environmental Concern*, 2nd Ed. Athens and London: The University of Georgia Press.

Bergmann, S (2003) *God in context: A Survey of Contextual Theology*, Aldershot: Ashgate publishing Ltd.

Bergmann, S (2005) *Creation Set Free: The Spirit as Liberator of Nature*, Chicago: Wm, B Eerdmans.

Boadi, J.A. (2009) *Christianity or Traditional Beliefs and customs?*, Ghana : UGC Publishing House.

Bodley, H. John (2001) *Anthropology and Contemporary Human Problems* Fourth Edition, Mountain view: Mayfield Publishing Company.

Boff, L (1993) *Ecology and Liberation: A New Paradigm*, Maryknoll: Orbis Books.

Boutguignon, F., and S.R. Char kravarty (1998) *A Family of Multidimensional Poverty Measures*. Paris: Delta Working Paper.

Breuilly, Elizabeth and Palmer Martin (1992) *Preserving God's Creation in Christianity and Ecology*, London: Cassel Publishers Ltd.

Busia, K.A (1954) *The Ashanti of the Gold Coast* in D. Forde (eds) *African Worlds*, London: International African Institute.

Colchester, M (1994) *Sustaining the Forest: The Community-based Approach in South and South East Asia*. In Dharam Ghai, (ed.), *Development and Environment: Sustaining People and Nature*, Cambridge: Blackwell Publishers.

Conradie, Ernst and Field David (2000) *A Rainbow over the Land: At Home on Earth?* England: Ashgate Publishing Ltd.

Conradie, Ernst and Field David (2000) *A Rainbow over the Land*, South Africa: Western Cape Provincial Council of Churches.

Cooper, Tim (1990) *Caring for the Whole Creation*, Great Britain: Hodder & Stoughton Publishers.

Cornell, Joseph Bharat (1995) *Sharing Nature with Children*, Watford: Exley Publications.

Creffier, Mattias (2007) *Environment: Swiss Glaciers Melting Rapidly*. Global Information Network: 1.

Daly, Gabriel (1988) *Creation and Redemption*, Dublin: Gill and Macmillan.

Dankelman, I and J. Davidson (1988) *Women and Environment in the Third World: Alliance for the Future*. London: Earthscan Publications.

Dankwa, Addo Oseadeeyo III (2004) *The Institution of Chieftancy in Ghana*, Accra: Konrad Adenauer Foundation.

Dasgupta, P., and K. Malerb(1994) *Poverty, Institutions and the Environment-Resource Base*. Washington, D.C.: World Bank.

David, Mark (2006) *Are You Taking Global Warming Seriously? MIT Offers Perspective*. *Electronic Design* 54.24: 17.

Deiningner, K., and B. Minten (1999) *Poverty, Policies and Deforestation: The Case of Mexico*. *Economic Development and Cultural Change* 47: 313-44.

Dickson, K. A (1984) *Theology in Africa*, London: Longman & Todd Ltd.

Dooley, Erin E (2001) Hot New Report On Climate Change. Environmental Health Perspectives 10.4: 1.

Dott, Robert H Jr. And Donald R. Prothero (1971) Evolution of the Earth, New York: McGraw Hill Inc.

Durning, A.B (1989) Poverty and the Environment: Reversing the Downward Spiral. Worldwatch Paper 92. Washington, D.C.: Worldwatch Institute.

Eaton, John (1995) The Circle of Creation: Animals in the Light of the Bible, London: SCM Press.

Echlin, P. Edward (1999) Earth Spirituality: Jesus at the Centre, New Alresford: John Hunt Publishing.

Echlin, P. Edward (2004) The Cosmic Circle: Jesus & Ecology, Dublin: The Columba Press.

Echlin, P. Edward (1992) The Deacon and Creation, London: Church Union.

Edwards, Denis (1992) Jesus the Wisdom of God: An Ecological Theology, New York: Orbis Books.

Edwards, Denis (1995) Earth Revealing, Earth Healing, Collegeville: Liturgical Press.

Ekbom, A., and J. Bojö (1999) Poverty and Environment: Evidence of Links and Integration in the Country Assistance Strategy Process. Africa Region Discussion Paper 4, World Bank, Washington, D.C.

Environment (Sixteenth Edition) 97/98 Editor: John L. Allen, University of Connecticut.

Enger, Eldon D and Bradley F. Smith (1995) Environmental Science, USA: WCB Publishers.

Erickson, J. Millard (1998) *Christian Theology* 2nd Edition, Grand Rapids: Baker Books.

Francis, A. Shceiffer (1967) *Pollution and the Death of Man: The Christian View of Ecology*, Tyndale House Publishers: Wheaton, Illinois.

Feuerback, Ludwig (1957) *The Essence of Christianity*, New York: Harper and Brothers.

Foster, T (1986) *A Common Future for Women and Men (and All Living Creatures): A Submission to the World Commission on Environment and Development* . Ottawa: EDPRA Consulting Inc.

Garbrah, B.W. *The Ecological Implications of some Akan Traditional Religions Practices and Festival*, *Trinity Journal of Church and Theology*, Volume X, January/July 2000, Number 1&2.

Geisler, L. Norman (2005) *Christian Ethics: Options and Issues*, Michigan: Baker Book House.

Ghai, D., ed (1994) *Development and Environment: Sustaining People and Nature*. Cambridge: Blackwell Publishers.

Granberg-Michaelson, W (1984) *A Worldly Spirituality: The Call to Redeem Life on Earth*, San Francisco: Harper and Row.

Granberg-Michaelson, W (1988) *Ecology and Life: Accepting our Environmental Responsibility*, Texas: Word Books.

Gwatkin, D.R., and M. Guillot (1999) *The Burden of Disease among the Global Poor: Current Situation, Future Trends and Implications for Strategy*. Working Paper, Global Forum on Health Research. A shorter version of this paper will be published in *The Lancet*.

Hagan, George P (1999) Traditional Laws and Methods of conservation and Sustainable use of Biodiversity in Amlalo et al (eds) Biodiversity Conservation Traditional Knowledge and modern concepts, Accra: EPA.

Hans, S (2002) Creation: William B. Eerdmans Publishing Company, Grand Rapids, Michigan, UK.

Health and Binswanger (1999) Natural Resource Degradation Effects of Poverty and Population Growth Are Largely Policy Induced: The Case of Colombia. Environment & Development Economics I(1).

Hendry, George S (1980) Theology of Nature, Philadelphia: Westminster Press.

Hodgson, Peter; Marignac Yves (2001) Is Nuclear Power a Viable Solution to Climate Change? The Ecologist 31.7: 20-23.

Hughes, G., M. Dunleavy, and K. Lvovsky (1999) The Health Benefits of Investments in Water and Sanitation: A Case Study of Andhra Pradesh, India. Washington, D.C.: World Bank.

James, A. Nash (1938) Loving Nature: Ecological Intergrity and Christian Responsibility: Abingdon Press.

Jodha, N. S (1986) Common Property Resources and Rural Poor in Dry Regions of India." Economic and Political Weekly XX1(27): 1169-81.

Kasemann, Ernst (1969) The Beginnings of Christian Theology: New Testament Questions of Today, Philadelphia: Fortress Press.

Leach, M., and R. Mearns (1988) Beyond the Woodfuel Crisis: People, Land and Trees in Africa. London: Earthscan Publications.

Mathews, T. Jessica (1991) Preserving the Global Environment, USA: The American Assembly.

Mante, J.O.Y. (2004) African Theological and Philosophical Roots of our Ecological Crisis, Accra: Son Life Press.

Manjunath, D.L (2007) Environmental Studies, India: Chennai Micro Print Ltd.

McFague, Sallie (1997) Supernatural Christians: How We should Love Nature, Minneapolis: Fortress Press.

McCormick, A. Richard, Notes on Moral Theology, April - September 1970.

Moltmann, Jurgen (1996) The Coming of God: Christian Eschatology, London: SCM Press.

Mugambi, J.N.K (1995) From Liberation to Reconstruction: African Christian Theology after the Cold War, Nairobi: African Educational Publishers Ltd.

Northcott, M (1996) The Environment and Christian Ethics, Cambridge: Cambridge University Press.

Nukunya, G.K (2003) Tradition and Change in Ghana: An Introduction to Sociology 2nd Edition, Accra: Ghana Universities Press.

O'Donovan, W (2006) Biblical Christianity in Modern Africa, U.K.: Paternoster Press.

Obeng, E.A. Healing the Groaning Creation of Africa in Getui and Obeng (eds) Theology of Reconstruction.

Passmore, John (1980) Man's Responsibility for Nature Ecological problems and Western Tradition, 2nd Edition, London: Duckworth and Co.

Pepra, Regina (2004) Rapture and After: Second Coming of Christ Series, Kumasi: UGC Publishing House.

Ruether, R.R (1992) *Gaia and God: An Ecofeminist Theology of Earth Healing*, San Francisco: Harper Collins.

Sarpong, Akwasi Peter, *Asante Culture and Belief Systems in the Modern World: Keynote Address Delivered at the Otumfo Opoku Ware II Jubilee Foundation on Tuesday, October, 18, 2005.*

Sarpong, Akwasi Peter (2000) *Letters to my Grandfather*, Accra: Sub-Sahara Publishers.

Santimire, H. Paul (1985) *The Travail of Nature: The Ambiguous Ecological Promise of Christian Theology*, Minneapolis: Fortress Press.

Schnaibery, A and Gould, K.A (1994) *Environment and Society: The Enduring Conflict*, New York: St. Martin's Press.

Scott, John (1990) *Decisive Issues Facing Christians Today*, Michigan: Fleming H. Revell.

Scott, John R. W (1976) *Basic Christianity*, Leicester, England: Inter-Varsity Press.

Theodore, Heibert (2000) *Christian and Ecology-seeking the well Being of Earth and Human*, Howard University Press.

Utto, Galarneau (1992) *Jerusalem in East Boston*, New England: Synod Lutheran.

White, L. *The Historical Roots of our Ecological Crisis* in Granberg-Michaelson, W (1988) *Ecology and Life: Accepting our Environmental Responsibility*, Texas: Word Books.

Whitworth, Patrick (2006) *Becoming a Citizen of the Kingdom*, Great Britain: Terra Nova Publications.

Young, A. Richard (1994) *Healing the Earth: A Theocentric Perspective on Environmental Problems and their Solutions*, Nashville, Tennessee: Broadman and Holman Publishers.

OTHER PUBLICATIONS

Agroforestry Manual for Farmer's Decision in Northern Communities of Ghana (2004) prepared by Ghana-Canada in Concert Programme.

Alaskan perceptions of Climate Change. Centre for Research on Environmental Decisions, Columbia University.

Climate Change in the American mind. National Oceanic and Atmospheric Administration Science. Advisory Board's Climate Working Group 2008 Retreat on a National Climate Service Vail Colorado.

Do global attitudes and behaviours support sustainable development. Population and the Environment Geography Department, University of Oregon.

Siberia is Melting *Current Science* 91.4 (2005): 7

National Biodiversity Strategy for Ghana, Ministry of Environment and Science, 2002.

14th Annual General Meeting of the Ghana Institute of Foresters held on the 10th October 2009 at Sunyani (Eusbelt Hotel) National President's welcome address.

INTERNET SOURCES

Akabzaa, T. and Darimani, A. (2001), *Impact of Mining Sector Investment in Ghana: A case study of the Tarkwa Mining Region*, A Draft Report, www.saprin.org/ghana/research/gha_mining.pdf.

A wudi, B.K. (2002), *The Role of Foreign Direct Investment (FDI) in the Mining Sector of Ghana and the Environment*. A Paper Presented at the Conference on Foreign Direct Investment and the Environment 7 - 8 February 2002, OECD, Paris -

France by George B. K. A wudi, Friends of the Earth -Ghana, Accra,
www.oecd.org/dataoecd/44/12/1819492.pdf

ENCART A Encyclopaedia (2005), www.encartaencyclopedia.com

Environmental Protection Agency (EP A) (2005),
<http://www.epa.gov.gh/mining/index.html> Ghana Chamber of Mines (2005),
<http://www.ghanachamberofmines.org>

Ghana Chamber of Mines (2006), Publications
<http://www.ghanachamberofmines.org/publications/index.php>

Ghana Chamber of Mines (2007), Publications
<http://www.ghanachamberofmines.org/publications/index.php>

Ghana Minerals Commission (2006), Legislative Overview <http://www.ghanamin.org/ghweb/en/malmincom/mclegislation.html>

Ghana Minerals Commission (2007), Developmental Projects
<http://www.ghana-mining.org/ghweb/en/ma/mincom/mcprojects.htm>

Mbendi (2002), Mining Profile for -South Africa,
<http://www.mbendi.co.zalindy/ming/af/salp0005.htm>

Mbendi (2004), Mining Profile for Ghana,
<http://www.mbendi.co.zalindy/ming/gold/af/gh/p0005.htm>

Mbendi (2004), World Mining Overview,
<http://www.mbendi.co.zalindy/ming/p0005.htm>

Obuasi Goldmines Report (2005),
http://www.anglogoldashanti.com.gh/NR/rdonlyres/60D3OE4A-6B43-470B-BBCO-A1D8FFD981OE/O/Ghana_Obuasi.pdf

Stephens, C. and Ahern, M. (2001), Worker and Community Health Impacts Related

to Mining Operations: A Rapid Review of the Literature, http://www.natural-resources.org/minerals/CD/docs/mmsd/topics/worker_community_health.pdf

UNIDO (2001 a). Media Corner, Feature: Artisanal gold mining without mercury pollution, <http://www.unido.org/doc/371455.htmls>.2001

Think Quest Encyclopaedia, (2007)
<http://library.thinkquest.org/05aug/00461/under.htm>

Wikipedia Free Encyclopaedia, 2006, <http://en.wikipedia.org/wiki/Mining>.

World Health Organisation (2005),
http://www.rbm.who.int/cmc_upload/0/000/015/370/RBMInfosheet_3.htm



APPENDICES

APPENDIX I

PEOPLE INTERVIEWED

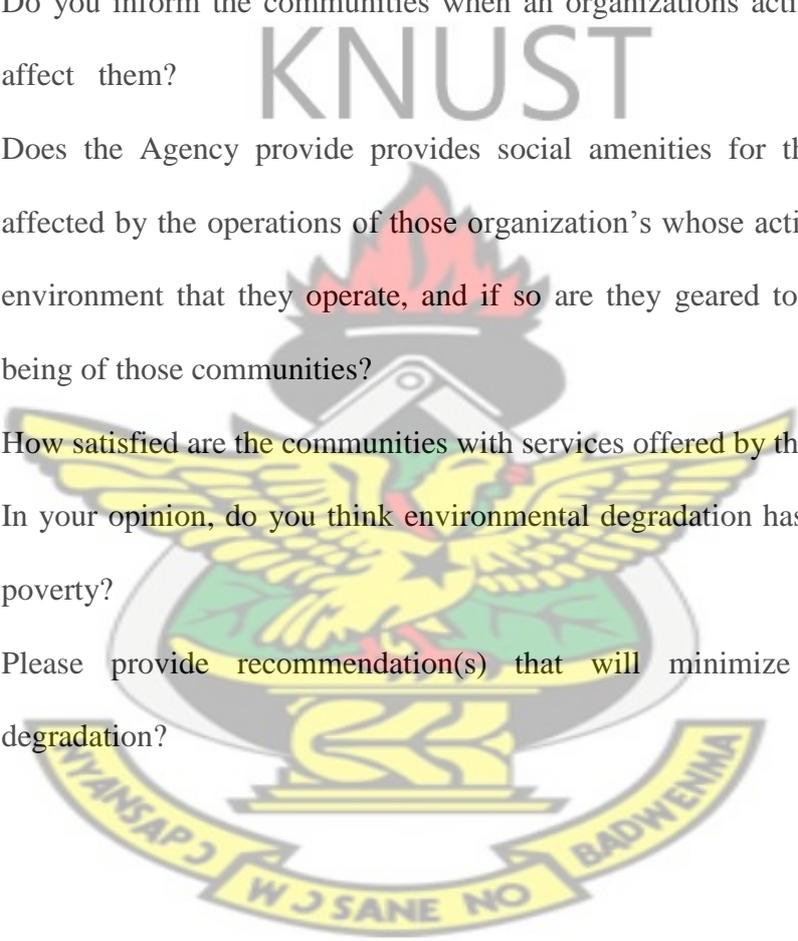
Name	Status	Date
1. Nyame Festus,	Member, PIWC Asokwa	8 th Jan, 2012
2. Omanhene Kwaku Boateng	Programmes Officer EPA, Kumasi	9 th Jan, 2012
3. David Barnes,	Assistant Programmes Officer EPA,	10 th Jan, 2012
4. Bruce Kyei	CEO Friends of the Earth (NGO)	12 th Jan, 2012
5. Kofi Nyame	Friends of the Earth	12 th Jan, 2012
6. Kwaku Agyei,	Assembly Man, Manso Datano	13 th Jan, 2012
7. Mr Osei Hwere	CRO, Adanse Mining Co.	14 th Jan, 2012
8. Kwasi Brefo	Adanse Mining Co.	14 th Jan, 2012
9. Rev. Monica Brako ,	Osei Tutu SHS Sec. Sch.	23 rd Jan, 2012
10. Rev. Justice Appiah Kubi	Grace Baptist Church, Amakom,	30 th Jan, 2012
11. Rev. Atta Mensa	International Charismatic Church	31 st Jan, 2012
13. Rev. Ntiamoah Mensa	Nsuta Kwamang Presbyterian Church	4 th Feb, 2012
14. Rev. Father Francis Tetteh Bluer,	St. Andrews Anglican Church, Kwamo	7 th Feb, 2012
15. Rev. Father Isaac Boakye,	St. Peters Catholic Church	9 th Feb, 2012

APPENDIX II

INTERVIEW GUIDE FOR EPA OFFICIALS

1. Designation
2. Department
3. Length of time working with the agency
4. What are the objectives of the Agency?
5. What factors actually causes environmental degradation?
6. How does the Agency perceive environmental degradation?
7. What are the strategies put in place by the Agency in tackling environmental degradation?
8. How often does the Agency educate Ghanaians on the effects of environmental degradation?
9. How do you rate the quality of facilities (e.g. computers, logistics etc) available to you at your work place?
10. Does the Agency have any means where aggrieved parties could channel their complaints in relation to environmental degradation?
11. What complaints do you normally receive in connection with environmental degradation?
12. What measure(s) have you put in place in resolving environmental degradation?
13. How are complaints processed by the agency?
14. Does the Agency show concern when there are complaints on issues relating to the environment?
15. How fast does the Agency attend to those complaints?
16. In your opinion how has the environment been degraded?

17. How do you see the operations of the various organizations whose activities affect the environment?
18. How do you perceive the effect of Environmental degradation on human kind?
19. How do you perceive the Agency's relationship with communities in which organization's activities affect the environment?
20. Do you inform the communities when an organizations activity is likely to affect them?
21. Does the Agency provide provides social amenities for the communities affected by the operations of those organization's whose activities affect the environment that they operate, and if so are they geared towards that well being of those communities?
22. How satisfied are the communities with services offered by the Agency?
23. In your opinion, do you think environmental degradation has any impact on poverty?
24. Please provide recommendation(s) that will minimize environmental degradation?



APPENDIX III

INTERVIEW GUIDE FOR MINING COMPANIES

1. Sex
2. Highest level of Education
3. Name of Mining Company
4. Designation
5. Department
6. Length of time working with the company
7. How do you see the operations of the mining company on the environment?
8. How do people perceive/react to your presence in the community?
9. How do you perceive the company's relationship with the communities in which they operate?
10. Do you have some ethical principles guiding your operations?
11. Does the company provide social amenities for the communities they operate?
12. Do you think these facilities provided by the company are geared towards the well being of the mining communities?
13. Has there ever been changes in operations of the company that might affect the mining companies?
14. Do you inform the communities when your activities are likely to affect them?
15. Does the company have any means where aggrieved parties could channel their complaints in relation to environmental degradation?

16. Does the company show concern when there are complaints on issues relating to the environment?
17. How often does management attend to those complaints?
18. How satisfied are the communities with services being offered by the company?
19. In your opinion, do you think environmental degradation has any impact on poverty?
20. Please provide any suggestion(s) that could help improve environmental degradation and vicious cycle of poverty.



APPENDIX IV

INTERVIEW GUIDE FOR GALAMSEY OPERATORS

1. Highest level of Education
2. Has your company been registered?
3. Name of Company, if any?
4. How long have you been a Galamsey operator?
5. How do you see your operations on the environment?
6. How do you perceive your relationship with the communities in which you operate?
7. Do you provide social amenities for the communities you operate?
8. Do you have some ethical principles guiding your operations
9. Do you see your operation as likely to affect the environment?
10. Do you inform the communities when your activities are likely to affect them?
11. Do you often get complaints from the communities with regards to your operations?
12. Do you show concern when there are complaints on issues relating to the environment?
13. How do you attend to those complaints?
14. How satisfied are the communities with your operations?
15. In your opinion, do you think environmental degradation has any impact on poverty?
16. Please provide any suggestion(s) that could help improve environmental degradation and vicious cycle of poverty.

APPENDIX V

INTERVIEW GUIDE FOR COMMUNITIES AFFECTED BY MINING AND GALAMSEY OPERATIONS

1. Sex
2. Highest level of Education
3. Name of District
4. Length of time staying in the District?
5. How do you see the operations of the mining activities on the environment?
6. How do you perceive the company's relationship the communities in which they operate?
7. Does the company provide social amenities for the communities they operate?
8. Do you think these facilities provided by the company are geared towards the well being of the mining communities?
9. Are you informed by the mining/galamsey operators when their activities are likely to affect the community?
10. Does the company have any means where aggrieved parties could channel their complaints in relation to environmental degradation?
11. Does the company show concern when there are complaints on issues relating to the environment?
12. How often does the company attend to those complaints?
13. Is there any record of confrontation between the company and the community?
14. In your opinion, how can you reclaim the degraded land?

15. In your opinion, do companies obey the laws of the land or seek profits for themselves?
16. How satisfied are the communities with services being offered by the company?
17. In your opinion, how do you see the impact of the activities of the company on poverty?
18. Please provide any suggestion(s) that could help improve the effects of environmental degradation and vicious cycle of poverty.



APPENDIX VI

QUESTIONNAIRE FOR CHURH MEMBERS

Thank you for accepting to participate in this research on the Christian attitude towards environmental and vicious cycle to poverty, the objective of which is to satisfy an academic requirement only. Confidentiality of any information provided by you shall be guaranteed and your identity will not be disclosed under any circumstance.

Your kind co-operation is very much appreciated.

1. Sex

Male

Female

2. Level of Education

Post graduate

Graduate

Secondary

Others (Specify).....

3. What church do you belong to?

Please specify.....

4. For how long have you been a member of this church?

.....

5. As a member how do you perceive your relationship with other members and the parish?

Very cordial

Cordial

Unpleasant

Very unpleasant []

6. What is your idea of environmental degradation?

.....
.....
.....

7. How does the church perceive environmental degradation?

.....
.....
.....

8. Does the church preach/educate its members on environmental degradation?

Yes []

No []

9. Do you see the education of the members on the environment as the responsibility of the church?

Yes []

No []

10. What do you think are the effects of environmental degradation on human kind?

.....
.....
.....
.....

11. Do you think environmental degradation has an effect on poverty?

Yes []

No []

12. Please give reason(s) for your answer to the above question?

.....
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.....
.....

13. In your opinion, what are the challenges that churches faces in managing environment degradation?

.....
.....
.....
.....

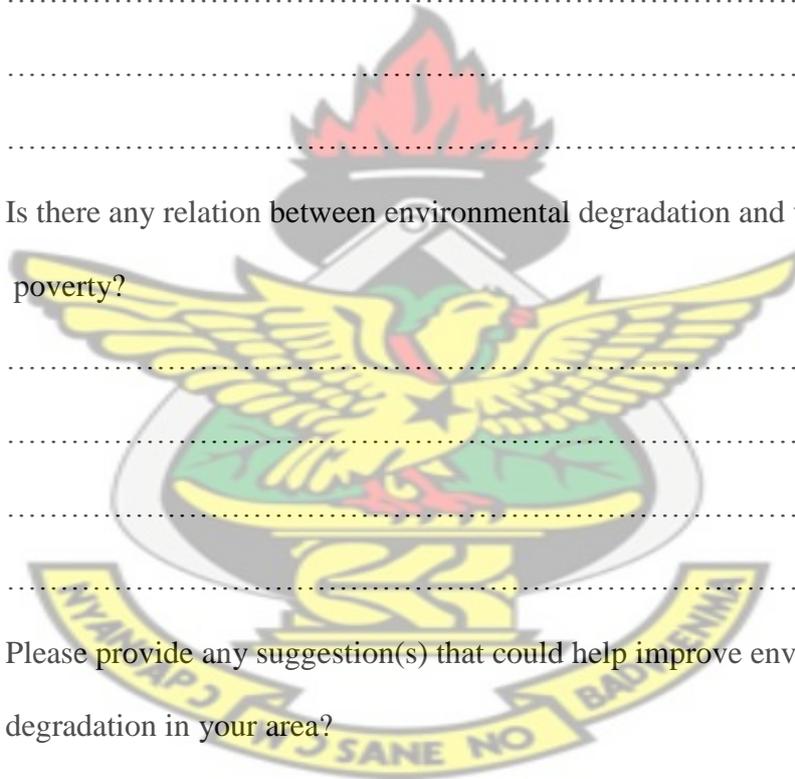
14. Is there any relation between environmental degradation and vicious cycle of poverty?

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.....

15. Please provide any suggestion(s) that could help improve environmental degradation in your area?

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APPENDIX VII

INTERVIEW GUIDE FOR CHURCH PASTORS

1. Sex
2. Level of Education
3. Title
4. For how long have you been a Priest?
5. How long have you been a member of this parish?
6. What is the church's theology on the environment?
7. How many times do you preach on the environment?
8. Do you have any teaching materials on the environment?
9. What are the strategies put in place by the church in tackling environmental degradation?
10. Are you allowed to use your own initiative in preaching on the effects of environmental degradation?
11. Does your parish receive complaints about environmental degradation?
12. What measure(s) have you put in place in resolving environmental degradation?
13. What do you think would be the challenges faced by churches in managing the degraded environment and its effect on poverty?
14. In your opinion, do you think environmental degradation have any impact on poverty?
15. In your opinion, what are the effects of environmental degradation on human kind?
16. Do you have any recommendation(s) fight against the degrading the environment and its effect on poverty?