

EDUCATION AND THE AFRICAN ENVIRONMENT: A CRITICAL ANALYSIS

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Abstract

The value added chains of educational benefit towards the environmental protection of Africa can never be overemphasized. This is because education is the catalyst for human emancipation which empowers the human person with techniques of preserving the environment. This Chapter investigated the relationship between education and the African environment. Using secondary data, the qualitative study found that with proper education, Africans can defend their eco-system from common threats which seek to endanger the natural resources domiciled within it as well as ensure integral development of the human person within his environment by being equipped with basic skills of conserving the environment. It recommended creation of awareness about human cultural values and curbing environmental degradation as practical steps of integrating education with African traditional values of education. The study concluded that through proper education, the African ecosystem would be conserved for generations to come even as the current generation relishes its gains.

Keywords: Africa, Education Climate, Ecosystem, Environment, Pollution

Introduction

The global call for protection of the environment can only be achieved through a deliberate, well-articulated and concerted educational plan. This is because education being the hallmark of development is critical in the attainment of this objective given that no meaningful development is possible without it. Africa is not left out from those continents suffering the brunt of environmental degradation, hence the need for a critical analysis. An analysis of what constitutes environmental education in the African setting; the parameters and indices for effective environmental education; challenges and setbacks to the attainment of effective environmental education in Africa; possible ways on how to attain

effective environmental education in Africa, are posited as concrete measures to be used in the attainment of commendable environment for Africa.

Spadework

a. Education

Why should education take central stage in the quest for ensuring a friendly African environment? It is simply because of education is a unique talent by which human beings sharpen and enlighten one another. Education has been described by the Dictionary of Etymology as the process of facilitating learning, acquisition of knowledge, values, beliefs, morals skills and habits, has its roots from the Latin word *educaten*- bring up (children), to train. *Educaten* is from the past participle of the Latin word *educare* meaning to 'bring up, to rear. It is also related with the verb *educere* which means bring out, or lead forth. Given that the role of education is to bring out or bring forth salient qualities in people, Africa can be said to be in dire need of an educational blue print that places premium on the environment

b. African Environment

The continent of Africa has five main types of ecosystems namely coastal environments, deserts and semi deserts, mountain environments, savanna grasslands, and forests. Each of these ecosystem has its typical environment and climatic setting. also over the years, people who lived in these places have adjusted and gotten adapted to them so as to be able to use the resources available therein.

The conservation and preservation of the African environment requires a strong will from all stakeholders in both public and private sectors to ensure that human interference does not lead to infraction on the ecosystem (Kwashirai V.C). The term "Ecosystem" was first coined by A.G.Tansley, an English botanist, in 1935. The ecosystem refers to the structural and functional unit of ecology where the living organisms interact with each other within and around their surrounding environment. In other words, an ecosystem is a chain of interaction between organisms and their environment.

Literature Review and Discussion

The discussion about Africa and its environment as observed by Juliette B (2021), Africa is endowed with about 30% of the world's mineral reserve with 65% in arable land and 10% renewable energy source. However, But Africa's challenge is immense. It must quickly implement programs to restore and protect ecosystems while addressing issues such as climate change, security challenges, food security

and biodiversity loss. The region must also wrestle with the cruel irony that it is the most exposed region to the adverse effects of climate change despite contributing the least to global warming

Traditional African Society: A Historical Sketch

The traditional African conceived himself an integral part of his environment. He communicated and shared his joys and sorrows with his environment through series of rituals. The environment needed to be spoken to by means of a variety of rites to either appreciate it (when bumper harvests were realized), appeased it (when a taboo against the land was committed); and at some other times, the rites were simply carried out to curry for favors. All the seasons had different rites to usher in such seasons. The traditional African society through its many tribal settings did not have the tools to exploit the environment to the deplorable state as we have it today. Different societies were however able to harness the available resources for their immediate needs by the use of hand tools which at best could be described as environmentally friendly. Even smith works which required the application of metal never went through the mechanized system. Production of the needed equipment was

Traditional Indigenous Education and the African Environment: Merits

There are several benefits attributable to Traditional Indigenous African Education (TIE) which when properly managed, can boost a renewal of understanding on the management of the environment in this present time. First the promotion of communalism (strength in unity through diversity) can serve as an avenue for creation of awareness on the dangers of unwholesome practices against the as bush burning, indiscriminate felling of trees. Also, the transmission of cultural values and heritage through folklores and folktales which discourages the abuse of the environment in whatever manner can play a major role. Other values which included the respect of elders, bravery, crafts and art works can be revived to inspire towards proactive commitment to the preservation of the environment. Modern farming which tend to put more pressure on the land, exposing it to various forms of degradation leaves us with a challenge from the traditional method of farming (which used only organic fertilizer that aided the preservation of the environment) due to entrenchment of moral and religious discipline

Demerits of traditional African Education in relation to the environment

Traditional African Education had simple and practicable approach towards existence; hence it was not complex or complicated. It was also oriented towards subsistent farming with the aid of animal dung as manure. Thus, it would seem like there is no downside to this practice in relation to the preservation of the environment. However, the absence of literacy and computation leading to poor historical data compilation count against the practice. Lack of systematized curriculum and reliance on oral communication modules made it difficult impart to visual and hearing disabilities. Under this system, it can simply be said that Trans-geographical language barrier made it difficult for ideas to be shared beyond one region to another.

Education and the African Environment: A Comparative Analysis

Munamoto C. (2019) observes that in the face of pollution, climate change and the depletion of or extinction of fauna and flora threatened by global warming, Africa has been left behind in terms of awareness and campaign. Thus, as observed by Nanbak (2020), combating these environmental problems in Africa require a strong revival of interest towards a deliberate investment in the preservation of the environment. This is possible through the application of both traditional indigenous African education module which never separated the man from his environment but acknowledged him as an integral part, and the modern technique of education which relies heavily on machines for the exploration of the earth. The many problems confronting the African environment threatening to endanger the region can be identified to include: deforestation, soil degradation, air pollution, and climate change and water scarcity. Furthermore, the indiscriminate felling of trees has also led to a decrease in forest reserves, thus exposing the land to desert encroachment. Rampant clearing of forests and land conversion for the purposes for agriculture, provision of fuel, urbanization and road construction have made the environment highly decimated, thus endangering it with whatever is contained within. Ninety percent of Africa's population requires wood to use as fuel for heating and cooking. Furthermore, illegal logging across the continent poses as a great threat to the environment as it speeds deforestation. Mining activities as well as bush burning also endanger the ecosystem by adding to the environmental warming within the region. Let us look at some of the problems of the African environment in detail below.

a. Soil Degradation

Soil degradations are caused by rains, winds and even by excessive manipulation by people for agricultural and industrial purposes. Growth in population has

made the soil to become a scarce commodity as people often throw caution to the wind in a bit to fend for livelihood. It is alleged that a main cause of soil degradation is lack of manufactured fertilizer being used, since African soil lacks organic sources of nutrients. The increase in population has also contributed when people need to crop, as a source of income, but do not take measures to protect the soil furthermore, the current method of agricultural practices put a lot of pressure on the soil as well thereby making the nutrients to speedily evaporate.

b. Air Pollution

The air in Africa is greatly polluted due to multiple reasons stated below. The primitive method of farming that takes place in most areas in Africa is certainly a causal factor. According to the United Nations' Food and Agriculture organization (FAO) about 11.3 million hectares of land are being lost annually to agriculture, grazing, uncontrolled burning and fuel wood consumption. Also the burning of woods which leads to the emission of carbon dioxide pollutes the air. This results in the germination of different airborne diseases in the air which is being absorbed by the organisms within the region. According to a report, sub-Saharan Africa is experiencing a fast increasing pollution which stemmed from many causes, such as burning wood for cooking, open burning of waste, traffic, agro-food and chemical industries.

Also the dust from the Sahara carried by the winds through the Sahel area, all this enforced by urbanization. For instance, in South Africa, the mercury level that is absorbed from the air into the soil and water is so high and is thus affecting every living organism in the region. "The soil allows the crops to absorb the mercury, which humans ingest. Animals eat the grass which has absorbed the mercury and again humans may ingest these animals. Fish absorb the mercury from the water; humans also ingest the fish and drink the water that has absorbed the mercury. This increases the mercury levels in humans. This can cause serious health risk".

c. Climate Change

The inconsistency of the climate of Africa makes it vulnerable and prone to environmental encroachment by harsh weather changes. These frequent climate twists have resulted massive food shortage for all species, sometimes forcing migration from one part to another. Caitlin Welsh (2021) alleged that African countries rely on imports to meet approximately 85 percent of their food needs, making African countries vulnerable to food price shocks—from economic, political, or climate-related phenomena -as in the global food price crisis of 2007-2008.²⁴ As African countries' food imports rise, their food exports are rising at the

same time, 25 so reduced agricultural yields result in foregone profits for producers. In this light, there is the need to create awareness through concerted educational campaigns to ensure judicious food usage. Campaigns against human activities abetting in Fas tracking climate change such as indiscriminate felling of trees and water wastages should be encouraged through such campaigns.

d. Water Scarcity

Some parts of Africa especially the northern part such as Algeria do not have sufficient rainfall all-round the year. This has greatly placed the environment in a porous state for habitation. Other parts cannot access good and clean water to drink as such waters are contaminated by other forms of pollution such as dust and industrial chemicals which find their way into the air and then settle in the water. This lack of water has endangered the biotic ecosystem in different ways.

e. Deforestation

The indiscriminate felling of trees for industrial and commercial purposes such as road construction and building without replacing them with new plants has exposed the environment severe hazards leading to an unprecedented warming not only in Africa but across the world. Due to poor enlightenment, Africans in rural villages have the habit of setting the bushes on fire which inadvertently destroy the fauna thus endangering in such habitat. In brief, causes of deforestation include but not limited to these: forest fires, illegal logging, harvesting of firewood, mining activities, and climate change.

Structure of African Ecosystem

The structure of an ecosystem is characterized by the organization of both biotic and abiotic components. This includes the distribution of energy within the environment. It also includes the climatic conditions prevailing in that particular environment. There are two major categorization of the structure of ecosystem namely: Biotic Components and Abiotic Components

The biotic and abiotic components both have strong relationship in an ecosystem. The ecosystems play crucial role in maintaining the balance of the environment. Some of the functions of the biotic and abiotic components of the ecosystem include, the provision of a guide to the basic ecological processes and also support the life system by rendering stability, provision of active support for the efficient cycling of nutrients between biotic and abiotic components, provision of equilibrium among the different trophic levels within the ecosystem, maintenance of balances in the movement of the minerals within the biosphere and abiotic

components which makes it possible for the synthesis of organic components that require the exchange of energy to take place.

Types of Ecosystem in Africa

There is the need to clarify the kinds of ecosystems available with the region of Africa in order to appreciate the abundant resources within as well as how they are gradually being pushed into endangered state by lack of care for the environment. According to Mohendra Shiwnarain (2018), an ecosystem is an interaction between living components and nonliving components to form a complex and relatively defined area. Many ecosystems blur into each other and there are not usually clear boundaries between them. In other words, an ecosystem can be said to be as small as an oasis in a desert, or as big as an ocean, spanning thousands of miles. There are two types of ecosystem: Terrestrial and Aquatic Ecosystems.

a. Terrestrial Ecosystem

Basically, terrestrial ecosystems are exclusively land-based ecosystems. There are different kinds of terrestrial ecosystems scattered across various geological zones within Africa. These are identified as follows:

i. Grassland Ecosystem

In a grassland ecosystem, the vegetation is dominated by grasses and herbs. Temperate grasslands, savanna grasslands are some of the examples of grassland ecosystems. Grasslands are not prevalent in Africa but are sparsely found in tropical African Savannah regions/it is characterized by sparse plants and lush grasses.

ii. Forest Ecosystem

A forest ecosystem is made up of several plants, animals and microorganisms that live in relation with the abiotic factors of the environment. Forests help in maintaining the temperature of the earth and are the major carbon sink. Africa has a large amount of forest ecosystem due to sufficient rainfall.

iii. Desert Ecosystem

Deserts are found in three areas in Africa, namely, the Sahara desert and the Namib Desert and the Kalahari desert. These are regions with very little rainfall. Here, the days are hot and the nights are cold.

b. Aquatic Ecosystem

Aquatic ecosystems refer to ecosystems present in a body of water. In other words, they are water-based and can only survive within and where there are waters. These can be further divided into two types, namely: Freshwater Ecosystem and Marine Ecosystem

i. Freshwater Ecosystem

The freshwater ecosystem is an aquatic ecosystem that includes lakes, ponds, rivers, streams and wetlands. These have no salt content in contrast with the marine ecosystem.

ii. Marine Ecosystem

The marine ecosystem includes seas and oceans. These have a more substantial salt content and greater biodiversity in comparison to the freshwater ecosystem.

Recommendations

a. Revamping Traditional Educational Values

African Traditional Values (ATV) that promotes respect for the environment should be identified and promoted within core curriculum for teaching in the classes. This approach could take place right from the elementary stage of modern education. Although subjects such as biology, agriculture and geography are taught, a more African environment- friendly approach which recognizes the benefits in African environmental science through traditional education be encouraged. An appreciation of the medicinal benefits of herbs which were used for curing certain ailments should also be revisited and brought into the modern system of education. All efforts should be made to synthesize the traditional, religious and community's leaders to promote among the people the cherished values inherent in the indigenous lifestyle which appreciated and treated the environment with reverence and dignity.

b. Training and Re-Training of Teachers

The value and dignity of the role of the teacher in the preservation and protection of the African environment cannot be overemphasized. Teachers are the catalyst by which ideas and measures are disseminated to the public through schools. Thus, for a positive change of mind about the damage being meted on the environment to take place, governments and stakeholders of different levels should invest in the training and retraining of teachers. The critical role the teachers can play after the retraining would be to serve as agents, creating

awareness within schools. Students can also become agents towards the attainment of this objective after being trained by the teachers to their parents.

c. Bridging the gap Between Digital Emigrants and Digital Natives

In an era where the elders have the knowledge but lack technological expertise, there is the need to bridge the gap them by harmonizing the two into a common pool of resource. The difference between digital natives and digital immigrants is that digital immigrants are goal oriented and digital natives are value oriented. Digital natives like to parallel process and multi-task (Martina C 2017). The older generation who are often regarded as the Digital Immigrants have so much to offer to the young who are regarded as the Digital Natives. The collaboration between the two would yield limitless possibility for the evolution of ideas (from the old) and the application of such (by the young) in a technologically driven society. Africa needs this synergy to not manage its environment but also to compete with other regions of the world on the table of discussion concerning other global matters.

d. Making a Case for Digital Education about the Environment

The African society has reached a crossroad where either proactive measures are taken to avert the looming threat of degradation or it is swallowed to collapse into precipice by our collective neglect. The way to go is to be digitally embrative from all fronts while making every effort to avoid endangering the environment due to our immediate and parochial needs. The attainment of this objective requires the involvement of all, both public and private stakeholders. Hence, a deliberate attempt should be made to create awareness about the environment in both formal and informal setting through the electronic media. The danger of the environmental depletion should be at the forefront of all educational plans across Africa.

e. Undertaking Exchange Programs between Africa and other Continents

The business of maintaining the environment is not a peculiarity of the African continent. Every continent has own share of the environmental degradation. Thus, there is the need to cross-fertilize ideas with experts of other regions through collaboration and exchange programs to explore best ways of tackling the menace of environmental pollution. Such exchange program will enhance global awareness and an appreciation of the challenge posed by environmental degradation.

Conclusion

Education has been the pivot of the African society whether one refers to the Indigenous Traditional education or the modern system of education. Indeed, the ITE had her own ways of imparting knowledge that led to the preservation of the environment back in the olden days. This was because the traditional ways of relating with the environment stemmed more out of religious beliefs which regarded the individual as part of the environment, hence the need to care for it. Back then, the unbridled desire to subdue the environment to gratify the unquenchable appetite of man had not been aroused.

The African man lived a simple life. However, with modernization, he is let loose on the environment by man in attempts to exploit the hidden treasures of the environment. This has adversely affected the ecosystem, thereby endangering the human being and other animals within the continent. To redress this threat, there is the need to underpin the core values of the ITE in the light of modern education to treat the environment with reverence and dignity as in the days of old. For this to happen, the need to put into practice the recommendations given in this work is critical.

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