



The Excessive Use of Fossil Fuel and Its Impact to Climate Change in Africa

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2019/41680

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Complete Peer review History: <http://www.sdiarticle3.com/review-history/41680>

Mini Review Article

Received 07 March 2018
Accepted 29 May 2018
Published 14 February 2019

ABSTRACT

Fossil fuel dependence in the African continent is so alarming with a constant emission of greenhouse gases (GHG), which includes methane, carbon dioxide, nitrogen dioxide and water vapor. The presence of these gases in the African climate has resulted in unprecedented change in weather conditions in Africa, and has accounted for low rainfall, constant flooding, and low food productivity. Many countries in Africa are continuously subsidizing petroleum products for their people and these may continue to worsen the situation. Curbing global warming through decarbonization of the African economy by reducing dependence on use of fossil fuels will be a gateway to a cleaner environment. This will go a long way to minimize number of deaths from illness, such as cancer, heart diseases, stroke, and reduce negative impact of extreme weather conditions as to flooding and low rainfall.

Keywords: Climate change; Africa; global warming; fossil fuel; weather; greenhouse gases.

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1. INTRODUCTION

Atmospheric CO₂ concentration started to increase since the industrial revolution and has been increasing rapidly since 1900. This increase is in proportion to fossil fuel usage [1]. However, Reducing dependence on fossil fuels will reduce CO₂ and other greenhouse gases emissions. Fossil fuels are by-product of organic matter from flora and fauna that were subjected to immense pressure and heat millions of years ago. Petroleum hydrocarbons are the major fossil fuel, during combustion, carbon dioxide and water are the major product [2].

Since the advent of oil industry in early 1900, petroleum has risen to a global prominence [1]. Energy Insight wrote, "development of drilling industries for oil wells in mid-19th century", America took over and added a new foot-print that led to massive consumption of fossil fuel products as a highly versatile fuel, powering transportation in form of automobiles, ships etc. Ever since then, Africa has its dependence on the petroleum product with no consideration to the inherent consequences of greenhouse gases emissions and other climate change related-issues.

However, African continent's have unique weather conditions that made it particularly vulnerable to severe consequences of global warming, which permeate every aspect of African life.

International business times wrote (2016), "Rising sea levels and coastal storms have destroyed parts of Kenya, with some streets turned to virtual rivers". It continuous, the coastal city of Mombasa is no longer endemic to flash floods, but this year (2016), the torrents were stronger than usual, which environmental scientist attributed to climate change. Outrage of floods have contaminated drinking water storage, leading to shortages and disease. Again severe drought in sub-Sahara Africa- like the one that grips East Africa in 2011, slashing crop yields and triggering food shortages and refugee crisis also has been linked to global warming" due to carbon emissions. Persistent carbon emission in African contents have also been linked to incessant use of fire-wood and fossil fuel products.

However, impact of global warming all around the world is very alarming but Africa is the worst hit, and most highly affected because of high

dependency on the use of fossil fuel for almost every facet of energy supply. Climate change according to International business times could be as bad as nuclear war. We need to act quickly.

2. ISSUES OF CLIMATIC CHANGE IN AFRICA

One of the worst listed content in the world that is most vulnerable to climate change is Africa. This unhealthy situation culminated as the result of Africa's dependence on the petroleum hydrocarbons coupled with the deteriorating state of the economic development and low funding by the member states. However, according to IPCC [3], Egypt is one of the African countries that is susceptible to harsh weather conditions. IPCC continues "Egypt will likely express an increase in water stress with a projected decline in precipitation and a projected population estimation of 179 million by 2050". temperature rise will likely reduce productivity of major crops and increase the water states, hence with a serious decrease in the crop water-use efficiency [3]. Mombasa with growing population according to World Bank [4] is already affected by climate-related disasters, especially floods, and strong winds. These disasters are projected to increase in frequency and intensity with long-term climate change [4]. According to IPCC estimation, emission of greenhouse gases will continue on the increase with a constant rise in the sea level with additional 8 to 20 centimeters by 2030 and between 21 to 71 centimeters by 2070 if care is not taken to control the situation. In addition to warming, changes in rain fall, increased flooding extreme heat events, pest and loss of irrigation water, which may affect yields [4]. In Africa, majority of greenhouse gases emission comes from land use, carbon-based fuels and deforestation.

IPCC (2010), reported Africa's chronic weather conditions, the report said, 'African continent has warmed about half a degree over the last century and by 2030 according to World Bank, it is expected that 90 million more people in Africa will be exposed to malaria, already the worst killer in sub- Sahara Africa. World Bank rescue project in Madagascar in 2006 was aimed at reducing and stopping the countries chronic exposure to the cyclone which includes conducting hydro metrological assessments for agriculture, cyclone impact modeling studies and updating infrastructural norms and standards.

However, in Nigeria, World Bank-supported project of \$100 million was to enable Lagos Rapid Bus Transport project in order to transform the congested public transportation system into a model that is faster and cheaper, and to reduce to barest minimum issues of carbon emission from out-dated car engines by at least 20%. The problem of greenhouse emission is very high in Nigeria most especially in urban areas like Lagos, and Abuja. Emission control mechanism is very poor, this has led to incessant emission of dangerous gases such as SO₂, CH₄, N₂O₂, CO, CO₂ and particulate matters. These gas emissions with low technological control system has been attributed to as worst contributor to illness such as cancer, heart disease, miscarriages, lung disease, prostate cancer, premature birth, low food, low agricultural yield, leading to hunger and malnutrition.

Nigeria today is facing very high rate of erosion menace, flooding, ocean surge, dryness, extreme low rainfall and drought due to climate change over the years and in recent time.

Danida (2011 & 2012), reports said that Kenya like other Sub-Saharan African countries face uncertainty and potential risk of climate change. According to report the country's fragile ecosystem will be put under intensive pressure arising from species migration due to habitat destruction and reduction. Biodiversity warehouse of Kenya is at risk due to reduced habitat and other human-induced pressures. Kenya's vulnerability to climate change is highly affected by the relatively weak institutional capacity; low resource management capabilities, inadequate technology, and information infrastructures, as well as land degradation (Danida, 2012).

However, it is anticipated that if these issues are not seriously addressed and perhaps properly managed, it will adversely affect countries sustainable development efforts including its plan to attain millennium development goals and vision 2030 master plan (Danida, 2012).

South Africa has one of the best renewable resources in the world but still contributes to high emissions due to its reliance on coal and other petroleum products for electricity generation, transportation, agriculture and industries (IPCC, 2012). The impact of carbon emission generated in South Africa is as high as in urban centers in Nigeria contributing to harsh weather conditions and emission related illness. In Africa life

expectancy in recent time is below 50 years as a result of high exposure to risk of carbon emission and malnutrition that culminated from the low caloric intake. There is uncertainty about life in Africa as a continent due to poverty and lack of policy implementation. People die every day in hundreds no body cares. Africa however, needs help from developed countries of the world in order to save their future generation. Climate change has been in the doorstep of Africa since 1970 as the result of rapid industrialization and urbanization with no effective control mechanism. Dependency on the use of fossil fuel products has worsened the situation with increase in carbon emissions. The most recent report by Intergovernmental panel on climate change (IPCC), predicated Africa's experience in the near future as follows;

1. Harsh weather conditions which include heavy storms and rainfall, part of the content to see 20% increases in cyclone by 2020.
2. Dramatic decrease in precipitation by almost 20% compared to 20 years ago impact.
3. South Africa and the Sahel region may be the worst hit.

Projected impact for human security according to the IPCC report may include:

- Exposure to water stress in the next 10 years, which is likely to affect between 75-750 million people and over 1.8 billion people by the end of the century, rainfall, and agriculture may decrease by 50% in some part of the African continent by 2020, IPCC reports said.

Drought is the key factor behind the declining productivity in Africa. There is a strong correlation between rainfall and GDP, And between land degradation and the incidence of poverty. Adaptation and mitigation are going to be central to the future development of the continent (Claudia, 2008).

Curbing Climate change in Africa:

- The first step to respond to climate change in Africa is to put to stop the issue of fossil fuel subsidy which will create access to cleaner environment.
- Decarbonization through forestation.
- Biotechnology input and biofuel production to augment fossil fuel.

- The need for biotech crops is crucial for dry and barren land in other to emancipate Africa from food shortage and low calorific intake. IPCC (2009) reported increasing number of biotech crops in Africa, compared to Latin America and Asia, with South Africa having a lead and need for more input
- Interest should be given to research and technology. Africa needs financial backing in these regards for growth and future development and
- Researchers to be encouraged through grants from world governing bodies and NGOs.
- Renewable energy generated from preserving natural resources, such as water, wind and solar generated biomass-will play a key role in replacing Africa's dependence on fossil fuel products, such as coal, oil and natural gas which are not renewable.
- Preventing forest loss will help to reduce issues of climate change. Since forests are the largest storehouse of carbon after coal and oil, deforestation bring about high accumulation of carbon dioxide in the atmosphere.
- Scientist estimates that up to 20% of global carbon emission from deforestation is greater than combined emission of cars, airplane and trucks summed up on earth's surface [3].

3. CONCLUSION

Research has shown that one-third of African income is generated through agriculture, Crop

production, and livestock husbandry accounts for half of the household. Poorest members of the society in Africa are those who are most dependent on Agriculture for jobs and income Today China is investing a huge amount of money building solar panels for electricity generation and solar cars for cleaner energy, while Africa is at limbo, however, since developing countries like Africa are still in the Dark Age having their dependency on the developed world, there is a need for brotherhood assistance from the developed world governing bodies like America, Europe, and China for African survival.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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