

# A Bundle of Opportunities: A Correction of Misconceptions about Climate Change

(Conference ID: CFP/144/2017)

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## **Abstract—**

*The changing climatic conditions have had huge effect on the physical and biological systems which have already been felt in the world. The climate induced changes are exerting considerable stress on the already vulnerable agriculture and energy sectors thereby threatening human and food security particularly in Sub-Saharan Africa. Climate change is extensively affecting the economic, social and environmental dimensions of national development. With a potential of making the current agricultural practices used unsustainable, the climate change situation calls for an urgent need for adaptation to avoid worsened food insecurity, malnutrition, diseases and poverty. Drought episodes, floods and heat waves have become more regular and on increasing intensity across Southern Africa, which is believed to be a manifestation of long-term climate change. This has adversely impacted inter alia on the quality of water, soil, agricultural production, food security, water security, the wildlife and energy sources. The adaptation process presents opportunities among others for cooperation, innovation and employment creation.*

**Keywords:** Energy, Agriculture, Global warming, Adaptation

## **Introduction and Background**

The changing climatic conditions have had huge effect on the physical and biological systems which have already been felt in the world. The climate induced changes are exerting considerable stress on the already vulnerable agriculture and energy sectors thereby threatening human and food security particularly in Sub-Saharan Africa. Climate change is extensively affecting the economic, social and environmental dimensions of national development. With a potential of making the current agricultural practices used unsustainable, the climate change situation calls for an urgent need for adaptation to avoid worsened food insecurity, malnutrition, diseases and poverty. The adaptation process presents opportunities among others for cooperation, innovation and employment creation.

Climate change refers to the change in average climatic conditions in a specific region due to the warming of the planet (global warming) that takes place as a result of the excessive accumulation of the heat trapping gases in the atmosphere; notably carbon dioxide, methane and nitrous oxide otherwise also known as the Greenhouse Gases (GHGs). Combustion of fossil fuels (oil, coal and gas), deforestation and forest degradation, and some

agricultural practices are among the human activities that lead to the emissions of the greenhouse gases. The changing over climate over time can also be as a result of natural variability and/or human activity (Pielke, 2012). This is succinctly captured in the United Nations Framework Convention on Climate Change (UNFCCC) that climate change is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over a comparable time periods.

## *Causes of Climate Change*

According to Melilo, Richmond and Gray (2014), human activities are contributing to climate change, primarily by releasing tons of carbon dioxide and other heat trapping gases, known as greenhouse gases, into the atmosphere every year. Therefore, natural causes alone do not sufficiently explain the variations in climate over time. The earth's climate is changing in the form of changing temperature and precipitation patterns, increases in sea level and acidity levels, melting of the glaciers and sea ice, the frequency, intensity and duration of extreme weather events as well as shifting in the ecosystem characteristics.

Melilo, Richmond and Gray (2014) observes that the natural processes such as changes in the sun's energy, shifts in ocean currents coupled with human activities such as emission of greenhouse gases into the atmosphere are the main causes of global warming experienced in the past century. Greenhouse gases are triggered by human activities through burning of fossil fuels for energy and heat, clearing forests fertilising crops, storing waste in landfills and raising livestock. Increased industrialisation and ultimately production of some industrial products and urbanisation through construction of roads and buildings change the reflectivity of the earth's surface leading to local warming (Melilo, Richmond and Gray, 2014).

## *Climate Change Impact on Human Life*

The impact of climate change on human life is far reaching. Climate change affects the environment which is a source of livelihood and inhabitant for humans and animals, affects the natural resources and the way of life in a variety of ways. Rising sea levels threaten coastal communities and the ecosystems. Human health is at threat as the scourge and intensity of communicable diseases increase as of the compromised quality of air and water. Efforts to counter the effects of climate change such as drought has resulted in new inventions and developments that further threaten human life. The Genetically Modified Organisms (GMOs) are both a relief and threat to human life.

According to warmer temperatures increase the frequency, intensity and duration of heat waves which can pose serious health threats particularly to young children and the elderly. Climate change manifests itself in changed amounts of rainfall and rainfall patterns. The timing and amount of stream flow has affected the water quality and supply of water injuries all water based industrial activities that support human life like fishing, tourism and generation of hydroelectricity. In extreme cases, too little rain can cause drought while too much rain has resulted in floods, droughts and outbreak of water born diseases.

## *Climate Change and the Threat to Development*

Climate change threatens to reduce or even reverse the gains made toward sustainable development. The threat is complex because it comes not only from the environment itself but also climate policy decisions. Addressing the latter requires that climate change be integrated into the existing social and economic processes that are currently driving development. A holistic approach will require the integration of social, economic, and environmental information to permit a full understanding of the impact of climate change on

development and to inform policy decisions in all the interconnected sectors. In general, climate change has a multiplicative effect on existing problems. For example, water stress will likely worsen in places already suffering from droughts, the Kariba Dam in Zambia. The impacts of choices made to mitigate climate are less clear because of the interconnections between various social and economic sectors. Countries are wrestling with the need to mitigate climate impacts in the long term, but adaptation offers the way of coping with the inevitable effects. The capability of a country to adapt depends on ability to monitor climate, provide reliable scientific information and predictions of the changing climate and to use the information acquired in risk reduction actions that promote sustainable development (Rogers, 2007). Stern (2007) argues that the international community should support global, regional, and national research and information systems on risk and should assist developing country governments in building adequate monitoring and dissemination programs at national level.

## **Opportunities and Threats posed by Climate Change**

Drought episodes, floods and heat waves have become more regular and on increasing intensity across Southern Africa, which is believed to be a manifestation of long-term climate change. This has adversely impacted inter alia on the quality of water, soil, agricultural production, food security, water security, the wildlife and energy sources (Tembo, 2011). Climate change continues to undermine the state capacity to provide opportunities and services that help the people to sustain their livelihood, consequently increasing human insecurity. This has had a sweeping impact on Third World countries with women and children being the most vulnerable who mainly survive on small scale farming in communities dominated by vast unemployment. Climate change has caused

marginalisation, firstly between the developed Western countries and Third World countries in that it leads to economic and social dependency both on capital and production by developing countries. The Third World countries are more vulnerable to climatic shocks than the More Developed Countries (MDCs) have mechanized primary industries and established and modern industrial bases. Poor countries who are highly dependent on agriculture mainly risk food insecurity in times of incessant or erratic rainfall and unpredictable patterns ultimately leading to drought.

The climatic hazards such as drought, floods, cyclones and hurricanes are likely to become more frequent, severe or both. In the face of such challenges climate adaptive measures has to be engineered and implemented. However, efforts to deal with climatic hazards are not new either at community, national or global level. Cooperation at the international level through that culminated in the signing of the Kyoto Protocol, though it has not achieved much to date is paramount for further state engagement in diplomatic and economic issues. International events such as the 2016 Paris Climate Conference are avenues for world leaders to meet and not only find solutions to climate issues but to a broad spectrum of intra and inter-state problems that cannot be left out to an individual country.

Droughts, floods and hurricanes are now a common phenomenon in Sub-Saharan Africa. Therefore proactive measures through disaster management have not only managed to reduce the impact and risk to human life of these climatic hazards but also created employment in the teaching of disaster management, implementation and evaluation of disaster relief programmes (Saundry, 2008). A number of Humanitarian organizations such as the International Community for the Red Cross and Red Crescent Society (ICRC), Care and Plan International have offered employment to many and helped address the social ills presented by

floods, droughts, hurricanes and cyclones. Finding 'green infrastructure' strategies that re-establish natural flood protections, like wetlands and floodplains is an alternative for the frequently flood ravaged countries like Mozambique. Other green investments such as forest protection can be considerably cheaper than conventional infrastructure, further solving the problem of deforestation and land degradation.

Furthermore, it is important to note that the adaptation to climate change process is synonymous to development or even sustainable development in a concept coined as 'climate resilient development'. The threat of drought brought about by climate change is an opportunity for research into new crop varieties, particularly short and drought resistant crops. Africa is endowed with plenty of highly nutritious drought resistant crops such as millet, sorghum and cassava which run the risk of extinction. Government support through increasing crop diversification, planting drought tolerant is critical in ensuring food security and fighting the scourge of drought brought about by climate change. Conservation agriculture and expanding farms under irrigation is another opportunity that can even be adopted by farmers in arid and semi-arid areas.

The acute electricity supply problems currently being experienced in Zambia and Zimbabwe can be attributed among other factors to the low water levels in Lake Kariba. It is therefore an opportunity for governments and the private sector to make partnership, explore and invest in new green energy sources. Zambia and Zimbabwe enjoy high temperatures that can be tapped in setting up solar fields in order to address electricity problems. Ideas for such projects can be borrowed from Government institutions such as hospitals and schools can be solar powered to alleviate pressure from the electricity main grid. The partnership between HopSol Private Limited and the Namibian

government helped create a 35 000 solar modules of thin film technology producing 3.5 mio kWh per year and thus supply 2 500 residential houses with electricity by tapping into the high temperature and alleviating power shortages in the country.

The majority of the mechanisms proposed here require the bottom-up approach to governance where the people and communities are actively involved thereby fostering citizen participation which is central to modern democracy. Therefore, instead of climate change being taken as a curse by Third World countries, an optimistic view can see it as an avenue for employment creation, a way to diversify the economy and particularly in agriculture, a means to introduce new sustainable and smart energy sources as well as act as a motivation for innovation to achieve economic growth and create political, social and environmental harmony from the communal to the global level.

## **Conclusion**

To retain and expand gains in improved livelihoods across the world and Third World countries in particular, adaptation to the impacts of climate change must be developed and implemented. At the national level, there are scattered efforts to analyze and implement adaptation measures but a more comprehensive and coordinated efforts towards adapting to climate change are crucial, especially as the poor are most vulnerable. An urgent and ongoing review of the international legal regime is required to adapt to change, and indeed to pre-empt the coming catastrophes, and equally important and challenging, to pursue the opportunities for economic development, job creation and a move away from highly polluting and unhealthy coal by strong leadership and decisive decision-making. It is also time to craft and put into place the so-called long-term scenarios on adaptation.

In order to respond to the inevitable impacts of climate change, policy responses must be

strengthened, and local communities as well as national governments need access to “appropriate economic resources, technology, information, skills and infrastructure”. Creating an “enabling environment facilitated by suitable policies and programmes at the local, national and international levels” is vital. Moreover, leaders in developing countries must engage the international community firmly in the negotiations for political and economic solutions. Establishing a “common negotiating stance and a clear position” on the main issues is

indispensable. Though, massive responsibility has been placed on African leaders, solutions must stem from within Africa while developed countries “should ensure financing of adaptation and appropriate mitigation actions using new and additional sources of swiftly accessible funds which will ensure that the existing international aid and commitment are met, also creating a variety of opportunities to the local population.

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