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Research Paper

CLIMATE CHANGE INDUCED HUNGER AND POVERTY IN AFRICA

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Abstract

Africa is vast — about as big as the United States, China, India and Australia combined. And it holds great wealth — in its forests, its oceans, its minerals and more. But Africa's resources are being depleted far too quickly. And if we don't protect them, we're putting the continent, and the more than 2 billion people who will call it home by 2050, at grave risk. Africa will be one of the continents hardest hit by the effects of climate change. Increased drought, desertification, variability in rainfall and other consequences resulting from environmental changes undermine the continent's ability to adapt. Many African countries are marked by grinding poverty and hunger and possess unsupportable infrastructures and weak governance mechanisms that contribute to political instability. These fragile states have an increased risk of conflict. This paper opines that there is need for transition to technology in both short and long run. This will require enlisting the expertise of those who have the wherewithal and required skills and manpower to drive the adaptation agenda.

INTRODUCTION

Africa and the Global Response to Climate Change

About a quarter of the 192 parties to the United Nations Framework Convention on Climate Change (UNFCCC) gathered at Copenhagen in December 2009 to try to reach agreement on global action to combat climate change for the period after 2012 — successor to the Kyoto Protocol, followed by Paris convention in 2015 — some of them came from Africa . What is Africa's interest in this global effort to meet key climate change objectives? How did Africa perform in Copenhagen and Paris?

Did Africa make a difference to the outcomes of the negotiations at the Copenhagen Agreement and Paris agreement, given its passive role in Kyoto?[1,18,5,6,7,8, 13]

Most analyses of the impacts of climate change that have influenced UNFCCC agreements focus on medium- to long-term projections of carbon emissions and forecasting models of global warming, and cover mainly countries and regions for which relevant data are readily available. This leaves out most developing countries and regions, particularly Africa, due to unavailable data and trajectories. From an African perspective, this omission is serious and costly. As the poorest continent, Africa is considered most susceptible to climate change due to its vulnerability and inability to cope with the physical, human and socioeconomic consequences of climate extremes.

Moreover, existing adaptation mechanisms and resources under the Kyoto agreement designed to mitigate climate change's effects on Africa (and other developing regions) have been directed at limiting future carbon emissions, rather than addressing the region's vulnerability and lack of resilience to the impacts of climate change on its economies and populations. As late as April 2007, a report by the Intergovernmental Panel on Climate Change (IPCC) warned that Africa was not acting quickly enough to stem the dire economic and environmental consequences of greenhouse gas emissions (IPCC, 2007). What this report seemed to have missed or overlooked is that Africa's concern about climate change is not mainly in terms projections of carbon emission and future environmental damages. It is more about the links between climate change and droughts, desertification, floods, coastal storms, soil erosion — contemporary disaster events that threaten lives and livelihoods, and hinder the continent's economic growth and social progress.[14,18,22,26,28]

Due to the limited relevance of past and current global climate change agreements to Africa's climate and environmental problems, the hardest hit region has benefited least from the international climate change regime, which relates almost exclusively to funding and investments for green, low carbon growth. For example, Africa's participation to date in the Clean Development Mechanism (CDM) and carbon trading arrangements under the Kyoto Protocol has been minimal.1 Africa's negligible role in previous international climate change negotiations can be remedied by concerted action on the part of African leaders in the global round of negotiations. Africa has much at stake. The key question is: how can Africa make a global deal relevant to the impact of climate change on its economies and populations?

To address this question, we need to explore the link between climate change and socioeconomic conditions that intensify underdevelopment and poverty in Africa, and examine the different pathways through which climate change affects Africa's development.

We also need to highlight the opportunity that global deal can create for Africa to adapt to new, more efficient patterns of development that reduce its vulnerability
and improve its resilience.

There is need to invest in projects to protect the environment. The idea is that developing countries, which are minor environmental polluters, could benefit from such projects through foreign investment and technology transfer from developed countries, which are the biggest polluters. The CDM, which has developed into a US$6.5 billion market, has, unfortunately, not fulfilled its potential for mobilizing development finance and technology transfer for Africa: only 4 percent of global CDM projects are in Africa, and of 40 CDM projects involving forests only four are in Africa and none have passed the registration stage. See APP et al. (2009) for details on CDM rules and other existing carbon trading arrangements as they affect Africa and proposals for modifications[.1,2,11,29]

Impact of Climate Change on Africa's Development

Climate change is already a reality in Africa. There are prolonged and intensified droughts in eastern Africa; unprecedented floods in western Africa; depletion of rain forests in equatorial Africa; and an increase in ocean acidity around Africa's southern coast. Vastly altered weather patterns and climate extremes threaten agricultural production and food security, health, water and energy security, which in turn undermine Africa's ability to grow and develop. Climate and environmentally

related disasters which threaten human security can induce forced migration and produce competition among communities and nations for water and basic needs resources, with potential negative consequences for political stability and conflict resolution.[18,20,27]

(i) Pathways through which Climate Change and Development Interact

Agriculture and food security: Agriculture, which provides a livelihood for about three-quarters of Africa's population, is mainly rain-fed. Severe and prolonged droughts, flooding and loss of arable land due to desertification and soil erosion are reducing agricultural yields and causing crop failure and loss of livestock, which endangers rural and pastoralist populations. The Horn of Africa's pastoralist areas (Ethiopia-Kenya-Somalia border) have been severely hit by recurrent droughts; livestock losses have plunged approximately 11 million people dependent on livestock for their livelihoods into a crisis and triggered mass migration of pastoralists out of drought-affected areas. Climate change is also contributing to oceanic acidification and an increase in surface water temperatures around the African continent, negatively affecting fish stocks and threatening the livelihood of coastal and small-scale fishing communities.2

The impacts of climate change on agriculture and other key economic sectors in the food production and supply chain, such as forestry and energy, threaten food security across sub-Saharan Africa.

Health: Increases in temperature, climate change-induced natural disasters and scarcity of safe drinking water due to droughts are major contributors to the spread of infectious and water-borne communicable diseases in Africa. Many more millions are being exposed to malaria— already a leading cause of death in Africa — due to temperature increases and intensifying rains which affect previously malaria-free areas such as the Kenyan and Ethiopian highlands. A recent joint UNEP-UNAIDS study has established complex links between climate change and the HIV/AIDS epidemic in Africa (UNEP and UNAIDS, 2008). Climate change also has indirect effects on health in the region through ecosystems degradation and unsafe water and poor sanitation, which contribute to malnutrition, cholera and diarrheal diseases and increase in child mortality. Poor water and sanitation is linked to climate-induced droughts and floods, and, according to WHO and UNICEF (Joint News Release, March 2008), accounts for more than 20 percent of the burden of disease in Africa. Diarrhoea is the second leading cause of death for African children.

Forced migration: Weather extremes, shifts in climate and the degradation of ecosystems threaten livelihoods2 Inter Press Service News Agency (IPS) report on "climate change and diminishing fish stocks" [http.www.ipsnews.net/]. Accessed September 23, 2009 and erode human security, causing forced migration and population displacement. Already, droughts and the drying of river basins in southern and eastern Africa as well as floods and rising sea levels in western Africa have induced migration of individuals and communities in search of alternative livelihoods. Examples of climate change-related migration in Africa include: the continuous movement of pastoralist communities of northern Kenya ravaged by both droughts and floods; rural-urban migration in Ethiopia due to adverse environmental changes in its highlands; and internal displacement of population in the low-lying and flood-prone plains of the river Niger in Nigeria. These migrants and refugees represent a major policy challenge for African governments in terms of humanitarian assistance and sustainable long-term solutions, in addition to national security concerns linked to competition for scarce resources between migrants and local populations.

Conflict: Climate change may seriously threaten political and economic stability, as, for example, when communities and nations struggle to access scarce water resources or when forced migration puts previously separate groups into conflict over the same resources.

Given the history of ethnic, resource and political conflicts in Africa, climate change could aggravate territorial and border disputes and complicate conflict resolution and mediation processes. Conflict zones and potential flashpoints in Africa, such as Darfur, the Sahel, the Horn of Africa, the DRC and northern Kenya, all have populations living in fragile and unstable conditions making them vulnerable to climate change's effects and the risk of violent conflict. Declining water resources and diminishing arable land are already intensifying competition for those resources, and creating tensions for displaced populations or those moving in search of improved livelihoods ..Armed conflict and intensified national security concerns minimize capacity to cope with climate change.

Energy: Deforestation caused by illegal logging, the felling of trees for firewood and charcoal for cooking, and "slash and burn" farming practices has reduced biodiversity in Africa, and weakened the ability to adapt to climate change. Yet this situation reflects the reality of energy insecurity in Africa in terms of increasing demand due to population growth and dwindling supply of traditional fossil fuels. Heavy reliance on non-renewable fuel sources for domestic energy supply in most of sub-Saharan Africa contributes to ecosystem degradation, which is threatening wildlife and endangered species, and destroys natural forests. Unfortunately, loss of biodiversity is considered a marginal issue on climate change agendas in Africa, even though it could have negative economic consequences due, for example, to declines in eco-tourism. Conserving nature and restoring ecosystems should be an important policy consideration that links climate change adaptation with critical energy infrastructure and renewable energy supply such as solar, wind, hydro and geothermal power.

(ii) Climate Change and Development Link: An African Priority

The negative impact of climate change on economic growth and sustainable development in Africa, which is also limiting the ability of African countries to cope with climate change, makes a focus on development an African priority at Copenhagen. For Africa, the immediate need is not essentially that of reducing greenhouse gas emission, which is relatively low in the global context.

High-income industrialized countries, with one-sixth of the world's population, are responsible for nearly two-thirds of greenhouse gases. The need is for Africa to ensure that the current development impacts of climate change on its economies and populations are recognized and that a development agenda is integrated into the global Agreement.

Africa is extraordinarily diverse: its 53 countries have varied topology, resources, population sizes and cultures, and differences in development experience and performance. Yet, all African countries face the global climate change challenge, which threatens their development gains and prospects. In preparation for Copenhagen, recent decisions taken by African leaders at the African Union (AU) Summit and the Africa Partnership Forum/UN Economic Commission for Africa Special Session on Climate Change, and the statement by the AU spokesperson at the Summit on Climate Change during the present session of the UN General Assembly in New York show that the continent's political leadership is sufficiently aware of the threats of climate change. African leaders are united about the need for adaptation and mitigation strategies to

cope with climate change on Africa's development. Africans must speak with one voice on climate change and present a common position .

(iii) Climate Change and Poverty: An African Challenge

The poor are hardest hit because of their vulnerability to the effects of climate change. Most of the poor in Africa depend on natural resources and rain-fed agriculture for their livelihoods, and they are least able to cope with the shocks of climate change-induced droughts, floods, soil erosion and other natural disasters. Climatechange impedes poverty reduction. People will find it hard to escape poverty if vulnerability to climate change persists, and those who have emerged from poverty can easily slip back again. Higher frequencies of climate extremes have made it difficult for households that have recovered from one climate shock to cope with another. For example, in East Africa, pastoralists who have taken the decision on the movement of their herds from drought-stricken areas have found themselves facing livestock disease, conflict over access to land, and other such conditions that could plunge them back into poverty. Hence, climate change is a limiting factor on poverty-reduction strategies such as the UN's Millennium Development Goals (MDGs). A poverty- reduction agenda must be incorporated into the global agreement, and poverty concerns must be mainstreamed in climate change adaptation mechanisms and mitigation policies and programmes.

(iv) Climate Change and the North-South Divide: A Moral Imperative from an African perspective

As we have seen, climate change issues in the global North differ from the prevailing climate change concerns of sub-Saharan Africa. For the world's richest, industrialized countries whose energy systems and affluent lifestyles have contributed most to global warming, the priority is to avert a global climate change crisis through managed reduction of greenhouse gas emissions coupled with measurable influence and control over the process. Africa and other developing regions in the global South that have relatively low carbon emissions due to their lack of development need support
and assistance to ensure survival in the face of current and future climate change challenges. Africa bears the brunt of a global problem to which it, as the least developed region in the world, has contributed the least.

Poorer nations and regions have neither the wealth nor strategic capacity to impose their will on the global climate change negotiations. Any global response to climate change should first and foremost focus on securing global equity between those most responsible for climate change and those bearing most of the cost.[6,7,13,18,21,25,32]

Hunger Statistics

Useful facts and figures on world hunger.

1. **Some 795 million people** in the world do not have enough food to lead a healthy active life. That's about one in nine people on earth.
2. The vast majority of the world's hungry people **live in developing countries**,where 12.9 percent of the population is undernourished.
3. Asia is the continent with the most hungry people - two thirds of the total. The percentage in southern Asia has fallen in recent years but in western Asia it has increased slightly.

4. Sub-Saharan Africa is the region with the highest *prevalence* (percentage of population) of hunger. One person in four there is undernourished.
5. Poor nutrition causes **nearly half (45%) of deaths** in children under five - 3.1 million children each year.
6. One out of six children -- roughly 100 million -- in developing countries is **underweight**.
7. One in four of the world's **children are stunted**. In developing countries the proportion can rise to one in three.
8. If **women** farmers had the same access to resources as men, the number of hungry in the world could be **reduced by up to 150 million.**
9. 66 million primary school-age **children attend classes hungry** across the developing world, with 23 million in Africa alone.
10. WFP calculates that **US$3.2 billion** is needed per year to reach all 66 million hungry school-age children.[5,6,7,8,10,21]

CLIMATE CHANGE AND FOOD SECURITY IN AFRICA

Th e United Nations Development Programme warns that the progress in human development achieved over the last decade may be slowed down or even reversed by climate change, as new threats emerge to water and food security, agricultural production and access, and nutrition and public health. The impacts of climate change– sea-level rise, droughts, heat waves, floods and rainfall variation – could by 2080 push another 600 million people into malnutrition and increase the number of people facing water scarcity by 1.8 billion. A variety of climate and non-climatic processes influence flood processes, resulting in river floods, flash floods, urban floods, sewer floods, glacial lake outburst floods and coastal floods. Heavy precipitation events are projected to become more frequent in most regions throughout the 21st century. This would affect the risk of flash flooding and urban flooding.

Until recently, most assessments of the impact of climate change on food and agriculture sector have focused on the implications for food production and global supply food, with less consideration of other components of the food chain. In recent years, world food prices have skyrocketed, causing severe hardship for poor and vulnerable people throughout the world, and in particular in Africa. Between 2005 and 2008 world prices of rice, wheat and maize doubled, pushing more than 100 million people into poverty, including nearly 30 million people in Africa.[3,17] The causes of the food price crisis in Africa remained land degradation through outdated farming practices, inadequate power generation capacity and distribution networks, poor quality roads and port facilities, and lack of water storage and irrigation capacity that limited the development of agriculture, imperiled food security and held back trade in agriculture-based products.

Policy debates on the food crisis, such as the UN Food and Agriculture Organisation Food Summit in June 2008, failed to identify the role of sustainable land management in ensuring food security. Nevertheless ,land degradation is one of the important long-term factors affecting people's vulnerability to weather extremes. Land degradation is also considered as one of the greatest environmental challenges facing Africa today and is a major impediment to meeting basic human needs.18 According to the recent Global Assessment of Land Degradation, nearly a quarter of the land surface of the world degraded between 1981and 2003[5,9,.19]

Land degradation is also a result of poverty (e.g.cutting trees for farm land and energy), due to population pressure and lack of structural transformation of theDebay tadesse •

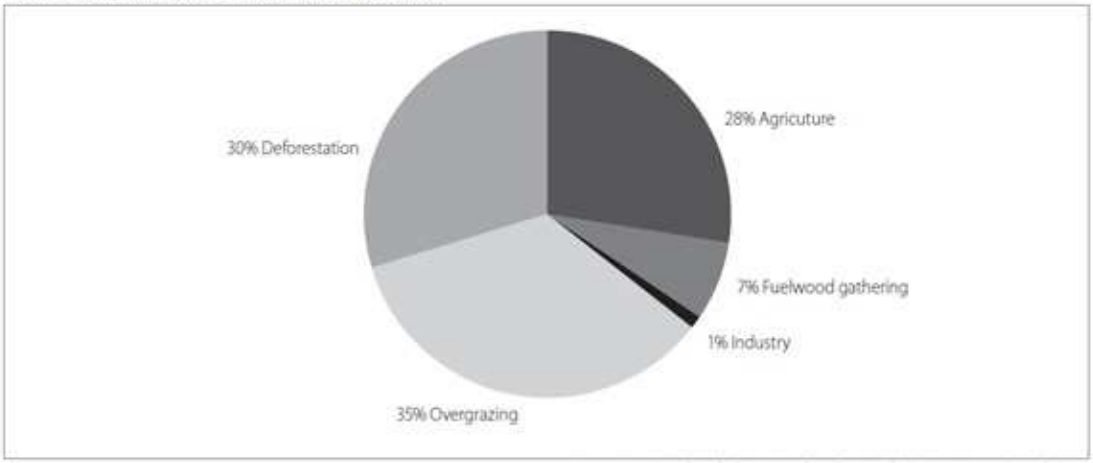
ISS Paper 220 • November 2010 **5**economies in rural areas. Figure 1 shows human activities that cause soil degradation[.16,17]

Severe and prolonged droughts, flooding, loss of arable land due to deforestation, overgrazing and fuel-wood gathering that has led to soil degradation are reducing agricultural yields and causing crop failures and loss of livestock, which endangers rural and pastoralist populations. The Horn of Africa's pastoralist areas (Ethiopia-Kenya-Somalia border) have been severely hit by recurrent droughts, causing livestock losses that have plunged approximately 11 million people who are dependent on livestock for their livelihoods into crisis and triggering the mass migration of pastoralists out of drought-aff ected areas.[9,20]

Definitions of food security identify the outcomes of food security and are useful for formulating policies and deciding on actions, but the processes that lead to the desired outcomes also matter. Climate change is affecting all four dimensions of food security in Africa,i.e. food availability, food accessibility, food utilization and food systems stability, . It will also have an impact on food production and distribution channels, as well as changing purchasing power and market flows. Its impacts will be both short term, resulting from more frequent and more intense extreme weather events, and long term, caused by changing temperature and precipitation patterns.[18,]21]

Recent work describing the functioning of food systems has helped to show both desired food security goals and what needs to happen to achieve them.22 Agriculture is important for food security both in terms of producing food that people eat and providing the primary source of livelihood for over 80 per cent of Africa's total workforce. If agricultural production in the low-income developing countries is affected severely by climate change, the numbers of rural poor people that will be put at risk due to vulnerability to food insecurity will surge.[18,26]

Figure 1 Human activities causing soil degradation



Source Erosion, Wikipedia, http://en.wikipedia.org/wiki/Erosion (accessed 29 July 2010)

Table 1 Summary of climate change impacts in Africa by 2009

Factor affected	Low-warming scenario	Mid-warming scenario	High-warming scenario
CO_2 atmospheric levels in parts per million (ppm)	600 ppm	850 ppm	1 550 ppm
Global temperature increase	1,8° C	2,8° C	4,0° C
Global sea level rise	0,18–0,38 m	0,21–0,48 m	0,26–0,59 m
Water	20–30% decrease in water availability in vulnerable areas	▪ Precipitation in sub-tropical areas falls by up to 20% ▪ Annual mean rainfall increases by 7% in East Africa ▪ Precipitation decrease of 20% along Mediterranean coast	30–50% decline in water availability in Southern Africa
Agriculture and food	5–10% decline in African crop yields	550 million additional people at risk of hunger	Decrease of 15–35% in agricultural yields across continent
Extreme events	Up to 10 million more people affected by coastal flooding globally	▪ Coastal flooding affects between 11 and 170 million additional people per year globally ▪ 10–20% increase in cyclone activity in the southern Indian Ocean	▪ 420 million people exposed to flooding globally ▪ Tens of millions displaced by extreme weather events and climate processes

Source Adapted from Oli Brown et al (eds), ***Climate change and security in Africa***, Nordic African Ministers of Foreign Affairs Forum, 2009, http://www.iisd.org/pdf/2009/climate_change_security_africa.pdf (accessed August 2010)

Case Study

There are many examples of conflict intertwined with the effects of climate change, including the widely discussed rainfall variability in Sudan that has been identified as an important factor in the Darfur conflict (Ki Moon, 2007). The variability in rainfall and the accompanying droughts have forced pastoral communities to change routes and watering holes, leading them to new and potentially unfriendly areas. Peoples' fight for survival has resulted in new conflicts. A closer look at pastoralism, characterized by nomadic migration and the tradition of raiding, may be warranted. It is a common thread in many cases of conflict driven or exacerbated by climate change.[18,20,21]

Adaptive Strategies

Many African countries, often with the assistance of international organizations or development agencies,have responded to the impacts of climate change. What is apparent immediately is the variety of responses, the lack of coordination and the highly experimental nature of some approaches. There is no coherent approach to the development of a food security policy for Africa.

Notable responses are often isolated and specific; for example, the efforts of Lake Olbollosat area residents in the heart of Kenya, who slowed down deforestation on the mountain slopes — which had been exacerbated by erratic rainfall caused by climate change — through reforestation. Namibia has battled desertification by using rain-fed pearl millet fields to produce a ground cover that holds the soil between rains. Similarly, the Konso of Ethiopia, living in one of Africa's harshest climates, have created inter-connected terracing systems that preserve fertile lands .

Clearly, such individual responses are essential to assure food production in threatened areas. In a broader sense, the African response must be local but must also reflect

cooperation among African states to produce a common voice to press upon the relevant international organizations the need for a broader response to the challenge of food security. Both the G8 and the G20 have recently emphasized the need for an integrated and effective approach to food security, and Africa must play a major part in shaping that effort.

To contain the negative effects of high food prices, governments have introduced various measures, such as price controls and export restrictions. While understandable from an immediate social welfare perspective, many of these actions have been ad hoc and are likely to be ineffective and unsustainable. In the long run, high food prices represent an opportunity for Africa's agriculture, but this will have to be accompanied4 by the provision of essential public goods. Smallholder gains could fuel broader economic and rural development.

Farming households can see immediate gains; other rural households may benefit in the long run if higher prices turn into opportunities for increasing output and creating employment. Africa and her partners must combine efforts in a strategic, twin-track approach to address the impact of high food prices on hunger. This should include: 1) measures to enable the agriculture sector to respond to the high prices; and 2) carefully targeted social protection programs for the most food-insecure and vulnerable.[4,18,23,31]

Recommendations

Africa needs to have an effective voice and influence on the global agreement to ensure that a development and poverty reduction agendas are included in the outcome and follow-up action. To this end ,the following recommendations are made.

National Action

Increased awareness of development implications of climate change and action

African leaders and policy makers should address climate change as a development issue and recognize its major impacts on human development and sustainable economic growth, and the crucial link with poverty. African leaders should also realize the opportunities and challenges created by climate change adaptation funds/resources to alter existing development patterns and practices. Climate change creates opportunities to devise adaptation strategies to ensure food security, protect human health, prevent forced migration and conserve nature. These may provide pathways out of underdevelopment and poverty.

Building climate change knowledge and capacity Africa should develop capacity for research and data collection, including meteorological infrastructure, to monitor climate change impacts, and formulate and implement policies to protect natural resources, including forests, and conserve energy based on clean low carbon technologies. At the same time, African countries should realize that climate change does not just require state-of-the-art information and new technologies, but also the need for people to respond, change their behaviour and find new livelihoods. Involve people at community and grassroots levels in the planning and execution of programs and projects to minimize how climate change affects human and socioeconomic development.

Regional Action

Coordinated and common African position

African political leadership has recognized the importance and timeliness for Africa to actively engage in global climate change negotiations via a coordinated common position to ensure the continent's interests are protected and its needs are met. This implies a key role for major continental and sub-regional organizations and institutions — the African Union (AU), United Nations Economic Commission for Africa (UNECA), African Development Bank (AfDB), Southern African Development Community (SADC), Economic Community for West African States (ECOWAS), among others — in promoting Africa's active participation in global efforts to meet climate change adaptation objectives relevant to the continent's interests.

Global Action

Integrating climate change into development assistance Link climate change adaptation with external assistance and put poverty reduction and sustainable development agendas in climate change negotiations.Climate change adaptation funds should respond to the objectives of the MDGs and the Paris Declaration on Aid Effectiveness. There is a need to connect development assistance flows for climate change adaptation with key principles of the Paris Declaration,that relate to poverty-reduction goals and the achievement of sustainable development. This calls for effective climate change adaptation governance, where the international response to climate change will be based on a shared understanding between developed and developing countries on the need for action on both current development impacts and long-term environmental goals and agreements. Developing countries should also not be obliged to transfer billions in debt repayments to rich countries most responsible for global warming, as this practice constitutes a huge drain on resources that could otherwise be spent on mitigating the impact of climate change.

Global governance innovations

Innovations in global governance should secure equity between those most responsible for climate change and those who have contributed the least, but bear the brunt of the problem. Existing and new adaptation initiatives should be governed by criteria and improvements that make them responsive to Africa's and the developing world's interests and needs.

Increased international cooperation

Provide technical assistance and capacity-building support to Africa through existing institutional and partnership arrangements, such as the Africa Partnership Forum (APF)3, the African, Caribbean and Pacif-ic Group of States (ACP)-EU Cooperation4, and such programs as the as UN Environment Programme (UNEP), the World Bank and the UN International Strategy for Disaster Reduction (ISDR)5, which aim to help African countries build their resistance to climate change vulnerability.[12,18,21,30]

CONCLUSION

Hunger: the new phase of climate change in Africa

Climate change is transforming the planet's ecosystems and threatening the well-being of current and future generations, increasing the rate of food shortage as a result of droughts, water shortage, and high temperatures globally.

Ever since the first climate talks in Geneva in 1979, there have been a series of climate talks, yet no profound solutions has been attained. This has driven world leaders and scientist into postulating false solutions to climate change which is rapidly driving the world into hunger and food shortages. The issue of food shortages and hunger has gradually given rise to a rapid bio-technological advancement which in turn has resulted to mass environment degradation, more loss of land, and has affected the livelihood of local farmers.

It was reported on the 9th of October 2012, in Rome –that about 870 million people, or one in eight persons, were suffering from chronic undernourishment and hunger in 2010-2012 (according to the new UN hunger report released). The *State of Food Insecurity in the World 2012 (SOFI)*, jointly published by the UN Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD) and the World Food Programme (WFP), presents better estimates of chronic undernourishment and hunger based on an improved methodology and data for the last two decades.

Among the vast majority of the undernourished and hungry people, 852 million people live in developing countries which is about 15 percent of their population, while 16 million people are undernourished in developed countries. With such figures, it shows that climate induced hunger is much stronger now than what it used to be. A few decades ago this was a result of an increase in the emissions from fossil fuels, gas flares, and greenhouse gases released into the atmosphere.

Among these undernourished and hungry people, Africa has been the only region where the number of hungry people has increased over the period- from 175 million to 239 million, with nearly 20 million added in the past four years. The prevalence of hunger which has reduced over the entire period, has risen slightly over the past three years from 22.6 percent to 22.9 percent - with nearly one in four hungry. In sub-Saharan Africa, the modest progress achieved in recent years up to 2007 was reversed, with hunger rising 2 percent per year since then. Developed regions also saw the number of the hungry rise from 13 million in 2004-2006 to 16 million in 2010-2012. This reversed a steady decrease in previous years from 20 million in 1990-1992.

All this has been a result of increase droughts, increase in temperature, monoculture and land grabbing resulting from false solutions postulated by scientistist from developed nations where pollution is on the increase due to their quest for technological advancement. This has caused more harm to the global environment than good. Food availability and access to adequate food constitute one of the most basic and essential requirements for maintaining a healthy and productive life. Presently, hunger and malnutrition comprise the major threats to human health (World Food Programme, 2009), and climate change will continue to affect all aspects of food security, especially in Africa, Asia, Latin America and the Caribbean, where more than 1 billion young men and women live.

Food insecurity and shortage is likely to pose a major challenge for developing countries that are vulnerable to extreme weather events and countries that have low incomes and a high incidence of hunger and poverty (Intergovernmental Panel on

Climate Change, 2007b; Food and Agriculture Organization of the United Nations, 2009b). Inhabitants of these regions are already at risk and will find it very difficult to overcome food production and income losses resulting from extreme weather events. This situation could mean short-term and long-term losses in food availability and access. Short-term infrastructural damage from extreme weather events of growing intensity can also make food distribution difficult.

The most affected region hit by compromised food security will be the rural areas of Africa, where more than half of the region's young people live. The greatest challenge faced within this context will arise from the impact of climate change on water resources available for agricultural utilization and domestic uses. In rural Africa, groundwater and rainfall are essential inputs for food production and are the main sources of potable water. One area currently experiencing a serious water deficit is the Sahel region where longer and more intense droughts constitute one of the most dramatic climatic changes recorded in any region. This situation is expected to worsen in the coming years, affecting more than 60 million young women and men. Outside the Sahel, groundwater supplies are expected to decrease by as much as 10 per cent, even with a 1oC increase in temperature.

Although less developed nations are likely to face a greater threat to food security, developed countries may be affected as well. In northern Australia and the southern United States, for example, food production could decline as a result of drier surface conditions too. Climate change mitigation processes has posed an additional challenge to food availability globally. Ironically, some climate change mitigation efforts have undermined food security, especially in less developed regions of the world.

The production of biofuels and other forms of bioenergy presents one of the greatest challenges in this regard. Bioenergy is the largest new source of agricultural demand in recent years, and this has important implications for food production and availability in areas where agricultural capacity is diminishing. It takes a lot more grain to power the world than to feed it. The corn equivalent of the energy used for a few minutes of driving would feed a person for an entire day, and that same person could be fed for a year with the equivalent energy burned from a full tank of ethanol in a four-wheel-drive sports utility vehicle.

REDD+ A carbon offset mechanisms is also another major challenge in this regard a process whereby indusralized Northern countries use forest, agriculture, soils, and even water as sponges for their pollution instead of reducing greenhouse gas emissons at source, which results to land grabbing in developing nations thereby reducing land space for agriculture and food production which inturn leads to foos shortage and hunger. These processes are no longer just false solutions to climate change but a new way of colonialism in order to false feed Africans in developing countries with Genetically Modified Organisms in this regard food crops manufactured in the laboratory. These climate change false solutions such as Biofuels production, bioenergy generation, REDD+ projects and GMOs should be rejected and resisted by developing nations.

Developed nations of the world should heed to the reduction of carbon emissions so as to reduced the impact of climate change globally to "below 2 degrees Celsius" and avoid "climate change, deep cuts in global emissions which is urgently required.[,5,9,14,18,22]

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