

■ The impact of climate change on health in the East, Central and Southern African (ECSA) region

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Climate change is occurring at an unprecedented rate throughout the world largely as a result of human activity. Global warming is caused by rising fossil fuel burning and land use changes which cause emission of greenhouse gases (GHGs) such as carbon dioxide (CO₂), nitrogen dioxide (N₂O) and methane (CH₄). Although emission of greenhouse gases in Africa is low (about 3.5%) compared to other regions, the continent is one of the most vulnerable to climate change and climate variability. The main consequences of climate change include temperature rise, sea level rise, decrease in rainfall, decrease in water resources, extreme weather events including more/frequent and severe droughts and floods. In the coming years and decades, climate change will affect many sectors of the economy including water resources, agriculture, food security, human settlements, fisheries and coastal zones and public health. The purpose of this paper is to outline the climate change concerns in the ECSA region, highlight some regional responses, challenges and good practices.

Public health impacts of climate change in East and Southern Africa.

The public health effects of global warming in Africa are related to the rising temperatures, severe water shortages and extreme events such as frequent and severe droughts, floods and storms. Climate change has impact on agriculture and food security; water supply, occurrence of extreme natural hazards, mobility and occurrence of infectious diseases; all of which have consequences on health.

Agriculture and food security

Higher temperatures, declining rainfall and water scarcity and floods in the ECSA region are impacting negatively on food production resulting in food insecurity. Decreased agricultural productivity in the coming years could lead to hunger and famine in some communities severely affected by climate change. This would in turn increase illness and death of vulnerable groups including women and children.

Water supply

Most of the climate change impacts in Africa are associated with rainfall variability and scarcity of water resources. The dramatic reductions of the snow and glaciers of Mount Kilimanjaro in Tanzania, Ruwenzori in Uganda and Mount Kenya in Kenya is a result of global warming. These glaciers could vanish in the next fifteen years. The glaciers of Mt. Kilimanjaro act as frozen water reservoir and supply the towns and communities around the mountain. Several rivers around Moshi town near Mt. Kilimanjaro are drying up due to global warming. This is already impacting negatively on production of coffee, bananas, maize and other crops.

Water resources have been decreasing over time as a result of persistent droughts and land use patterns. Climate change will exacerbate water shortages resulting in reduction of hydro power and increasing the incidence of waterborne diseases. The impact of severe water shortages in many eastern and southern African countries will be greatest in arid and semiarid areas.

Climate change and global warming are already impacting negatively

on hydro power generation in a number of countries including Kenya, Uganda, Tanzania and Zimbabwe, resulting in frequent power outages.

Extreme events and natural hazards

Climate change has increased the frequency and severity of extreme events such as floods, droughts and storms causing deaths, injuries, famines, disease outbreaks, psychological disorders and population displacements. The Maputo-Beira region of Mozambique has experienced frequent flooding in recent years resulting in injuries, deaths and displacement of thousands of people.

Extreme events such as heat waves could lead to an increase in the incidence of heat stress, respiratory and cardiovascular diseases.

Urbanization

Africa's urbanization rate of 4.5% per year is the highest in the world. In the eastern and southern African region, Dar es Salaam, Kampala, Luanda, Nairobi and Maputo are the fastest growing cities. The rapid urbanization poses challenges for infrastructure and services. Limited access to water, electricity and sanitation could increase vulnerability to outbreaks of waterborne diseases including cholera.

Poverty

High levels of poverty in ECSA countries and reliance on subsistence farming by the majority of the population increases vulnerability to climate change. Poverty is also associated with deforestation and environmental degradation which predisposes the population to famine, hunger, malnutrition and infectious diseases.

Air pollution

Air pollution from greenhouse gases (GHGs) is predominantly from the manufacturing sector but increasingly the transport sector (due to old motor vehicles) is being recognized as a major polluter particularly in the big African cities. Household energy including firewood, charcoal and kerosene use) and land use clearing are the other important contributors to air pollution.

Infectious diseases

Climate change has increased the occurrence and geographic range of vector borne diseases such as malaria and Rift Valley fever. The incidence of cholera and other waterborne diseases is increasing due to poor sanitation and extreme events including floods and droughts.

♦ **Highland Malaria epidemics** The East African highlands (western Kenya highlands and western Uganda) have witnessed malaria epidemics in recent years resulting in increased mortality due to lack of immunity in those communities. The malaria epidemics are a direct result of the higher temperatures, changes in rainfall patterns and deforestation and degradation of the environment. The mosquito vector thrives under the warmer temperatures. As temperatures continue to be warmer every year, there are predictions that high altitude areas such as Nairobi could be at risk of malaria outbreaks in the future.

♦ **Rift Valley Fever (RVF)** Climate change has resulted in several outbreaks of RVF in East Africa in the last ten years including the outbreaks in 1997-98 and the recent epidemic which affected Kenya, Somalia and Tanzania in 2006-7 and Sudan in 2007.

RVF is an acute febrile zoonotic disease caused by RVF virus (RVFV) which belongs to the family Bunyviridae and genus Phlebovirus. It is primarily a zoonotic infection but humans are infected either through exposure to the blood, body fluids or tissues of animals that have been bitten by infected mosquitoes or directly from bites from infected mosquitoes.

Outbreaks of RVF are usually associated with heavy rainfall and warm temperatures.

♦ **Chikungunya fever** Recent epidemics of chikungunya fever have been linked to climate change. Usually dry, warm conditions precede an outbreak. In 2004, following years of consecutive drought, chikungunya afflicted 500,000 people in East Africa. The most affected areas are the coastal towns of Lamu, Mombasa and the Indian Ocean Islands of Seychelles, Comoros and Reunion.

Chikungunya fever is a viral infection spread by mosquito bite. The main vector is *Aedes aegypti*. The disease is characterized by severe, persistent joint pains, fever and rash.

♦ **Cholera and diarrhoeal disease** The combination of higher temperatures, prolonged droughts and floods coupled with scarce water resources and poor sanitation make countries in ECSA vulnerable to outbreaks of cholera and other waterborne diarrhoeal diseases.

The recent outbreaks of 2008-9 of cholera in southern Africa have affected thousands of people in Zimbabwe (the worst affected), South Africa, Mozambique, Malawi, Angola and Zambia. The outbreaks are partly due to poor sanitation, water shortages, changes in rainfall and temperatures.

♦ **HIV/AIDS** In many countries in ECSA, HIV/AIDS has had a devastating impact leading to a loss of working age adults and leaving a large and growing number of orphans who are vulnerable to food insecurity and malnutrition, illness and death. HIV/AIDS seriously weakens the capacity of communities to withstand the effects of climate change.

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Current and forthcoming policy responses to climate change

African governments have committed themselves to tackling the climate change challenge. The African Union, NEPAD and the Regional Economic Communities (RECs) are committed to promote and support integration and implementation of adaptation and mitigation measures into member states national development plans.

Countries in ECSA are in the process of mainstreaming climate change into their national development policies, plans and budgets. Efforts are being made to integrate climate change into health programmes.

Many countries have developed National Adaptation Plans of Action which recognize health as one of the priority sectors. Environmental health management is one of the important strategies for improving the health status of the people.

Clean Development Mechanism (CDM)

The CDM under the Kyoto protocol provides an opportunity for developing countries to access capital to implement projects that are energy efficient and emit lesser green house gases (GHGs). So far African countries have benefited from capacity building on CDM rather than actual project investments. There is a need for capacity building in ECSA.

Adaptation Activities

Strategies to support adaptation to climate change include policy reforms, technology options, research and information sharing and human resource development.

New and innovative methods are being developed in response to climate change. These include use of drought resistant crops or genetically modified organisms, crop diversification, improved farming technologies, promotion of rain water harvesting, use of efficient and non-polluting sources of energy and policy reforms to control environmental degradation (e.g. encouraging reforestation). New technologies to harness solar energy are being explored.

Building capacity for climate change adaptation at the local level through civil society organizations as well as through regional organizations that promote collaboration in climate change is critical. It is equally important to build capacity for policy research on climate change.

The capacity for monitoring, prediction and timely warning is being strengthened through the WHO funded Drought Monitoring Centres

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(DMC) in Nairobi, Niamey and Harare.

Vector Control

Vector control through indoor residual spraying (IRS) has been successful in Mozambique, Swaziland and south Africa where outbreaks of malaria occur during rainy and seasons. Indoor residual spraying has significantly reduced the incidence of malaria.

Insecticide Treated Nets (ITNs)

In many countries in Eastern and Southern Africa including Kenya, Ethiopia, Malawi, Uganda, Tanzania and Zambia, ITNs have been widely distributed to protect households from malaria mosquito carriers. These programmes which are supported by the Global Fund and the World Bank have reduced millions of deaths from malaria in the countries.

Challenges

- ◆ Health systems and infrastructures are often weak, fragmented and overburdened. Management of environmental and health systems remains weak in many countries. Many health systems have not integrated environmental health and focus on curative measures.
- ◆ In many countries there are inadequate legal, policy and institutional frameworks for climate change. Although environmental and health laws exist, often there are no climate specific statutes.
- ◆ Inadequate adaptation capacity to deal with climate change. This is due to financial, human and technical resources constraints. In addition, there is limited technology transfer.

Some examples of good practice in managing climate change and health risks

A number of good practices in managing climate change and health risks exist in the ECSA region and a few will be highlighted below.

- ◆ **Southern African Climate Outlook Forum (SARCOF)** Southern African countries that are members of the Southern African Development Community have established a regional climate outlook forum to develop consensus annual forecasts which is then shared with farmers and other social economic sectors including health, disaster risk management, water resources, hydropower management and others. This provides early warning and improved information sharing.

The organization, SARCOF, is a collaborative effort between the SADC Drought Monitoring Centre (CDMC), the World Meteorological Organization (WMO), the United Nations International Strategy for

Disaster Reduction (UN/ISDR) and other partners.

- ◆ **Climate Risk Management (CRM)** Climate Risk Management aims at using climate information to forecast and prepare for floods, food insecurity, malaria and drought. It has been used successfully in Ethiopia, Mozambique, Malawi and other countries in Southern Africa.
- ◆ **Malaria Prevention and Control through Indoor Residual Spraying (IRS).** Indoor residual spraying using DDT has been successful in controlling Anopheles mosquito which spreads malaria in Mozambique, South Africa and Swaziland. This has drastically reduced the incidence of malaria and deaths caused by malaria.
- ◆ **Insecticide treated nets** High coverage of household with insecticide treated nets (ITNs) combined with indoor residual spraying in Zanzibar, United Republic of Tanzania has significantly reduced the malaria incidence. ◆

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