ClimDev-Africa

Policy Brief 2

Vulnerability to Climate Change in Africa: Challenges and Recommendations for Africa

The Intergovernmental Panel on Climate Change defines climate vulnerability as 'the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate stress, including climate variability and extremes.' Africa is highly vulnerable to climate change mainly because of its strong economic dependency on climate-related activities and products and low adaptive capacity. This low adaptive capacity is linked to weak economies, weak institutions and inadequately developed governance structures. Water, agriculture, health sectors and entire ecosystems, are sensitive to changing climate, including changes in the magnitude and frequency of extreme events. The rise of mean sea level will threaten African coastal cities, especially those cities close to major river deltas. The agricultural sector is sensitive to rising surface temperatures and varying rainfall, and these changes will affect the attainment of food security on the continent. Climate sensitive diseases (including malaria, meningitis, and cholera) are expected to expand to areas where they are not currently common. For example, malaria will likely expand to highland areas, where increased temperatures will make it easier for mosquitoes to breed.

Key messages

- Most African countries are highly vulnerable to climate change.
- Potential impacts related to climate change exist in all sectors.
- Adaptation policies and measures to cope with a changing climate will need to be tailored to local needs.
- The ACPC has an important role in reducing obstacles to integrating climate concerns into development activities and in identifying options to reduce vulnerability to climate change.

Sector vulnerability

Water Resources. Water availability and access in different parts of Africa are variable. Many African countries may have good per capita physical water, but the major constraint is access to water due to poor infrastructure, which means they are constrained due to economic water scarcity. Climate change and variability have the potential to impose additional pressure on water availability, accessibility and demand in Africa. Even in the absence of climate change, present population trends and patterns of water use indicate that more African countries will exceed the limits of their economically usable, land-based water resources before 2025. It is not currently possible to estimate climate change-related impacts on water resources with confidence.

Agriculture and Food Security. The risk of adverse effects on agriculture due to climate change, especially in semi-arid and sub-humid regions and in areas with more frequent and prolonged drought, may easily become life threatening. By 2020, in some countries, yields from rainfed agriculture could be reduced by up to 50 percent. Agricultural production, including access to food, in many African countries is projected to be severely compromised. This would further adversely affect food security and exacerbate malnutrition. By 2080,

arid and semi-arid land in Africa is projected to increase by 5 to 8 percent. Internal coping mechanisms are not likely to be adequate for many vulnerable populations, and the resources available for adapting to climate change may be outpaced by the impacts. Major impacts on food production will result from changes in temperature, moisture levels, ultraviolet radiation, CO_2 levels, and pests and diseases.

Coastal Ecosystems. A mean sea level rise of 0.48m by the end of this century will threaten coastal areas. Projected mean sea level rise will exacerbate the existing physical, ecological/biological, and socioeconomic stresses on the African coastal zone by inundating and eroding low-lying areas and/or increasing flooding caused by storm surges and intense rainstorms. This will also impact coastal ecosystems, such as mangroves, estuaries, deltas, and coral reefs, all of which play important roles in such economic activities as tourism and fishing. The expected rise of the surface temperature of Earth will affect both freshwater fisheries and marine fisheries. The impacts are likely to include a shift in the centre of production and composition of fish species, as ecosystems move geographically and change internally. Economic values are expected to fall.

Human Health. Under a changing climate, the resulting health risks to human populations depend on where and how people live. Of special concern are:

- *Small Islands*: Populations in small island developing states and other low-lying regions are vulnerable to death and injury and to destruction of public health infrastructure from increasingly severe tropical storms. Salinisation of water resources and agricultural land from sea level rise is also likely to be a concern.
- *Urban areas*: Rising global temperatures, combined with urban heat island effects, make urban populations, particularly those of tropical mega-cities, vulnerable to a combination of health risks, including heat waves, floods, infectious diseases, and air pollution.
- *Mountainous areas*: High temperatures are intensifying the risks of transmission of vector-borne diseases, such as malaria, to high-altitude populations that lack immunity against such diseases. Thus, mountain populations are at increased risk of water insecurity, floods and landslides, and infectious diseases.
- *Children*: Children are among the most vulnerable to the health risks caused by climate change.

Infectious agents and their associated vector organisms (mosquitoes, ticks, and sand flies) have their reproduction and survival rates strongly affected by fluctuations in temperature. Although it can be difficult to find links between the incidence of a disease and warming trends, associations have apparently been found in both Ethiopia and Kenya. In general, the most vulnerable populations are expected to be located on the fringes of currently infected areas.

Recommendations

The design and implementation of policies and measures to assist adaptation to climate change and to reduce vulnerability to it will be essential. Adaptation strategies need to promote a rich rep-

ertoire of policy options that can be implemented by appropriate institutions and organisations. Improving social resilience in the face of climate change should complement the aims of facilitating sustainable development and improving coping capacity. Planning for adaptation must begin with an understanding of vulnerable populations and regions and an assessment of the capacity of these groups and regions to cope with climate variability and change. Adaptation planning will need to be as spatially explicit as possible. Some adaptation needs include:

- Building capacity to collect and analyse climate change-related data. (The target should be to develop climate models and scenarios and to conduct vulnerability and impact assessments);
- Making research relevant to practical local needs;
- Readjusting existing management strategies to cope with climate change;
- Involving local populations and communities in developing management strategies. (This will allow management measures to be linked more closely with the people directly affected);
- Considering potential adverse impacts of adaptation measures;
- Developing and sustaining an insurance system as a way to share climate-related risks in Africa; and
- Developing regional approaches to combat the adverse impacts of climate change.

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