



Climate Change and Agriculture in Africa: Challenges and Promises

Africa remains the only region in the developing world where agricultural yields are low and continue to decline. Despite recent progress in agricultural and land management technologies, agricultural production in most parts of the continent is still at subsistence levels, with the smallholder producers who dominate the agricultural production landscape barely able to meet their own consumption needs. Agricultural production is very important in assisting food security and poverty alleviation, especially in rural African households. African agriculture is confronted by many challenges. The primary one is low investment in the sector by many African governments. Others include poor access to capital, inadequate infrastructure, and inappropriate market structures.

Climate change and climate variability add to the challenges that face the agricultural sector in Africa. Worldwide, considerable shifts in long-term averages and variability in rainfall and temperature, sea levels, and frequency and intensity of droughts and floods have been experienced. Africa too has had its share of increased climate variability and long-term climate change. Incidences of extreme weather events, including droughts and large fluctuations in precipitation patterns, and shortening of the lengths of growing periods have been occurring with increasing frequency. Given that agricultural production in Africa relies mainly on rainfall, with less than 4% of cultivated land under irrigation, such fluctuations expose African agriculture to frequent production uncertainties. African governments are particularly concerned with the impacts of high variability in rainfall and the high incidence of droughts on their economies and the agricultural sector in particular.

Key messages

- Even without the effects of climate change, the agricultural sector in Africa is facing numerous challenges that are responsible for its perennially low productivity.
- Climate change and climate variability threaten to diminish the ability of African agricultural producers to provide enough food for the expanding population of Africa.
- Many win-win options exist to help the agricultural sector in Africa adapt to climate change.
- The ACPC has an important role to play in facilitating considerations of these options.

Challenges, gaps and needs

Africa has a high level of exposure to production risks associated with climate variability and change. Africa's vulnerability is further aggravated by factors including overreliance on rainfed production, high levels of poverty, low levels of human and physical capital, and inadequate infrastructure. The result has been poor access to inputs and markets. Challenges exist to the development of appropriate policies for enhancing the capacity of Africa's agricultural producers to adapt to climate change and/or mitigate its effects. One such challenge is the mismatch between the data available and the data required to design effective policies, particularly at the regional, national, and sub-na-

tional levels. However, agricultural sector policies can focus on win-win options that promote sustainability of agricultural production and land use management even in the presence of uncertainty. Four important knowledge gaps exist that prevent information on climate change and climate variability from being integrated into agricultural policy. These include:

Uncertainty of climate change predictions. Climate change projections are uncertain. This results from natural variability in the climate system, an imperfect ability to model the atmosphere's response to any given emissions scenario, lack of sufficient data, and lack of tools and models at spatial and temporal scales appropriate for decision-making.

Uncertainty about impacts of climate change on pests. On average, 30-50% of the yield losses in agricultural crops are caused by pests despite the application of pesticide to control them. However, it is difficult to accurately quantify the potential impacts of climate change on pest damage given the complex and highly variable response of pests and their hosts to what could potentially be multiple and interrelated shifts in environmental conditions. These conditions include higher levels of CO₂, ozone, and temperature, changes in relative humidity and cloudiness, shifts in rainfall distribution and wind patterns, and land-cover and land-use change in response to climatic and non-climatic signals.

Uncertainty about impacts on agricultural water supplies. Water is the defining link between the climate and agriculture. Most of the world's countries classified as water stressed are in Africa. A reduction in run-off of up to 40% has been recorded in some major river basins in Africa, with a consequent reduction in reservoir storage. Although uncertain, it has been predicted that projected changes in climate will significantly affect surface water supplies over 25% or more of the continent by the end of this century. Temperature rise, changes in runoff volumes, and an increased frequency and severity of extreme climate events are likely to exert severe

pressure on the supply of water for agriculture. Future water resource availability for agriculture could further be constrained by the increasing urbanisation and industrialisation of society.

Lack of knowledge about adaptation practices and technologies. Many broad-scale analyses identify regions and crops that will be sensitive to climate change, but there is still sparse scientific knowledge on the practices and technologies that will allow farming systems to adapt to a changing climate. Many countries are developing National Adaptation Programmes of Action with the support of the United Nations Development Programme. However, most are based upon only minimal scientific evidence about the range of relevant adaptation options and impacts in different environments.

Role of the ACPC

The ACPC, as a continental body responsible for overseeing climate-policy-related issues, must ensure that the climate information and products that are provided to policy makers are based on high-quality data and good science. Based on its mandate and convening power, the ACPC will need to undertake the following:

- Coordinate with countries and advocate, at the highest level, the need to invest in sustainable agricultural development as a means to cope with climate variability and change, as well as to increase agricultural production in Africa.
- Assist regional bodies, such as the New Partnership for Africa's Development, to mainstream adaptation to climate change in investment programmes.
- Assist countries in Africa to develop and implement appropriate policies and strategies based on emerging science, tools, and methods to deal with the challenge of climate change in the agricultural sector.

Recommendations

The role of agriculture is central to most African economies and to the livelihoods of its people. As such, African governments must increase investment in the sector, adopt policies that will promote production, and encourage adaptation to existing climate variability and long-term climate change. Policies that can support the ability of smallholding producers in Africa to adapt to the effects of climate variability and change are needed. Some general recommendations for addressing the challenge of climate change in the agricultural sector are the following:

- African countries need to start integrating climate change and climate variability information into development policies and to stimulate investment in the agricultural sector. Interventions should ideally be win-win technological ones that improve land use efficiency and increase crop and livestock productivity.
- Countries need to engage their scientists, technical experts, agricultural economists, and policy makers to determine mechanisms to improve yields and land use efficiency.
- Increasing productivity in the livestock sector, e.g. by improving milk production per animal, is necessary to improve livelihoods and to mitigate greenhouse gas emissions.
- African countries need to invest in the generation of climate data, embrace mechanisms for information sharing, and coordinate regional actions through identified agricultural value chains.
- The African Climate Policy Centre can play a key role in linking science with policy at regional, national, and sub-national levels. It can also play a coordination role by synthesising data and information about climate variability and change to be used in developing effective agricultural policy for African countries and Regional Economic Communities.

ClimDev-Africa



For more information on ACPC and the entire ClimDev-Africa Programme, visit the ClimDev-Africa website at <http://www.climdev-africa.org>

This document is an output from research carried out by the African Climate Policy Centre (ACPC) in collaboration with selected experts and editors. ACPC is part of the Climate for Development (ClimDev-Africa Programme, a joint initiative of the African Union Commission (AUC); the United Nations Economic Commission for Africa (ECA); and the African Development Bank (AfDB). The programme is supported by several development agencies and governments. However, the views expressed and information contained in the brief are not necessarily those of or endorsed by these partner institutions which can accept no responsibility for such views or information placed on them.

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