



# Impact of Climate Change on Food Prices in Eastern and Southern Africa

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## What is the issue?

Climate change manifested in global greenhouse emissions, extreme weather patterns, and rising temperatures continues to be a global concern. Developing countries are most vulnerable to climate change, frequently experiencing extreme weather patterns such as drought, floods, heatwaves, storms, precipitation variations, and changes in sea level with devastating effects on agriculture, food security, nutrition, housing, health, travel, infrastructure and incomes. These developments threaten efforts to reduce extreme poverty, especially in low-income countries, and have led to reversals of gains for certain groups in terms

of incomes, health, and education outcomes besides increasing global inequalities. The paper focuses on the impact of climate change on the prices of all goods and services with a bias on its impact on the price of food in the Eastern and Southern Africa region. Specifically, the study isolates climate disaster events in each of the countries in the Eastern and Southern Africa region and assesses their implications on food prices besides analyzing the dynamics of the key climate change indicators and their implications on prices in the selected countries. The main countries of interest include Kenya, Uganda, Tanzania, Rwanda, Burundi, Ethiopia, Mozambique, Malawi, Zambia, and Zimbabwe.

## Why is this important?

Climate change impact in Africa is of particular concern, because of the dependence on rainfed agricultural systems, which have remained vulnerable to climate changes. More than 70 percent of the population in Africa lives in rural areas and is largely dependent on Agriculture. Moreover, more than 25 percent of the continent's Gross Domestic Product (GDP) is derived from agriculture which is more effective in reducing poverty than non-agricultural growth. Climate change not only increases uncertainty in quantities of agricultural production but also hampers productivity. Climate change disasters in Africa have led to high economic losses including damages to crops and livestock, loss of lives and livelihoods through death and displacements, diminished food security, famine, low capacity to generate electricity, damage to infrastructure, and low agricultural supply that has occasioned high consumer food prices.

In the Eastern and Southern African countries, rising food prices have necessitated short-term policy measures such as bans on exports of food crops, suspension of import tariffs on food imports to cushion against high food prices, cash transfer, and food subsidy programs, targeted distribution of agricultural inputs, among others. However, given the high import dependency of the countries, some trade measures implemented to cushion consumers in respective countries have resulted in an escalation of food prices within the countries, with spillovers on neighbouring countries. Long-term policy initiatives such as climate smart agriculture and climate risk management and disclosure frameworks have not been targeted as they have failed to provide adequate mitigation against climate risks for the affected countries.

Using descriptive and econometric approaches, the study sought to assess the impact of climate change on food and overall inflation in selected Eastern and Southern Africa countries.

## What are the study findings?

Countries in the Eastern and Southern African regions have exhibited rising trends in mean surface temperatures, with Zambia, Zimbabwe, Tanzania, and Uganda exhibiting the most erratic patterns. Similarly, precipitation in the region has been highly variable. The East African countries experienced severe drought seasons in the years 2011, 2008 and 2009, 2005 and 2006, 2000 and 2001, of varying degrees of severity. The 2017 El-Nino experienced disrupted weather patterns in 2018 and 2019. This led to below-average rainfall in the short rainy season between October and December 2018, a delayed onset, and below-average rainfall during the March to May long rain season of 2019, leading to food price increases in the region.

## The study findings reveal that:

- i. All the countries in the sample have experienced various climate change events with increasing intensity in the last two decades. Erratic weather changes manifested in floods had the greatest negative impact on human life in all the countries under review while storms have been prevalent in Zimbabwe and Mozambique in the recent past.
- ii. Based on the Climate Risk Index, 2019, Mozambique, Zimbabwe and Malawi were most affected by extreme weather events in 2019 and are at risk of either frequent events or rare but extraordinary catastrophes.
- iii. Short-term policy interventions were implemented in response to high food prices resulting from the impact of erratic weather patterns on agricultural supply but some of the policies were often counterproductive for countries that depend on one another to close food deficits.
- iv. Results show that climate change, measured by amounts of rainfall, rainfall volatility and temperature volatility, have significant effects on prices of food and other goods and services.
- v. Temperature variability affects not only food products but also the capacity to generate electricity with implications on food prices as well as prices in the other goods in the consumer basket.
- vi. The results show a strong transmission of foreign prices through imported prices to domestic prices.
- vii. At a macro level, the analysis shows that all countries have various climate change policy initiatives in place but are still vulnerable to climate change risks.

In terms of policy implications, the study showed that trade measures and domestic agricultural price support policy measures do not provide lasting solutions to high food prices resulting from extreme weather patterns. Long-term and effective climate mitigation measures are thus critical. However, experience shows that attainment of near-zero emissions supportive of low risks to climate requires massive financial resources, multi-pronged approaches as well as coordinated actions across countries. Advanced economies that are progressive in the trajectory of climate change mitigation have allocated massive investments toward the green economy and carbon pricing.

Conversely, most African countries including the ones covered in our sample, have limited fiscal space and high public debts, especially following the COVID-19 pandemic. Consequently, macro-level policy options for climate change mitigation requiring massive fiscal easing may not be feasible in the near to medium term. Based on the results of this study, therefore, it would be realistic to recommend that such countries consider focusing on the enhancement of sector-specific policies such as investment in other relatively cheaper sources of clean energy (solar, wind). This policy option will not only reduce electricity-related emissions but will also support the availability of alternative sources of energy and reduce reliance on hydroelectricity, which can lead to lower electricity prices and prices of other goods and services. Additionally, considering the dependencies of food imports across sampled countries and Africa in general, African governments can consider joint and coordinated climate action strategies at the continental level. For instance, this would include the development of a continental green growth investment package with clear responsibilities across African countries.

Based on the results of this study, it can also be argued that the significance of rainfall amounts in reducing prices implies a need to support the prioritization of investment in policies that lead to reliable water supply such as irrigation and food self-sufficiency strategies. However, some of these policies have been tried in some countries in our sample yet they have not attained food self-sufficiency as is the case in countries such as Israel where irrigation worked. Even as this policy is recommended, it may be necessary to evaluate the impact of irrigation on food productivity against costs at the country level and integrate experiences of countries where irrigation policies have worked. It is also worth noting that most countries in our sample launched climate change learning strategies in 2020 and 2021 implying that not all stakeholders on climate change have an adequate understanding of green growth. Entrenched awareness would be one of the policy options, which has worked in the advanced economies. At a macro level, the analysis supports the need for investment in further research to establish effective climate change policies and effective good practices in other countries that can be customized in Africa.

Based on the results, it is important for central banks to take a critical note of the emerging trends whereby, climate change is amplifying the effects and frequency of weather shocks on inflation and output, given the inflation-output tradeoff. Thus, it is becoming increasingly difficult for central banks to disentangle variation in the data relevant for the assessment of the medium-term inflation outlook. Thus, the central banks may act when they are not expected to or not do anything when they are expected to act. Extreme weather shocks that are prolonged may lead to central banks 'conventional monetary policy failing and the uptake of unconventional monetary policies which the central banks should be thinking about.

### Recommendations identifying key policy and advocacy issues

Recommendations	Attitudes, norms, and behaviors	Policies	Target sectors	Responsible entities
Encourage: 1) Investment in cheaper sources of clean energy (solar, wind). 2) Consumption of renewable energies.	Provide reasons for and against adoption of renewable energies with the intention of influencing investors/ consumers attitudes on uptake of renewable energies.	Tax incentives for companies in the manufacturing of green energy.	Energy	- Government - Private sector
Entrench climate change awareness and education in schools and communities. Adopt a 'green learning agenda'.	Build skills: 1) For green jobs- that will support transition to low carbon green economy. 2) For green life and transformation.	- Compulsory learning schools and colleges on climate change - Train community leaders on climate change	- Education - Agriculture	- Government - NGOs
Explore food self-sufficiency strategies	Inculcate positive attitudes towards growing and consuming home-grown foods.	Encourage with incentives private but effective irrigation programs	- Agriculture - Water	- Government - Private sector
Development of a continental green growth investment package	Embrace collaboration	Country specific policies	Macro	African Union Individual African countries
Development suitable monetary policy frameworks that are green. Develop monetary operations with green features to support the environmental goals of their respective government.	Open and aware of inflation induced challenges posed by climate changes. Consider modeling climate change in central bank models.	Monetary policy framework to be reexamined relative to merits of some design features of the framework, in particular the definition of the inflation target, the type of inflation measure used in central bank communications and how to appropriately calibrate the medium-term horizon of monetary policy.	Macro	Central banks



## Mission

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The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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