



Recent evidence on climate change risks for African agriculture

In 2007, the Intergovernmental Panel on Climate Change concluded that African agriculture and food security would face major risks under the influence of climate change. With an analysis of more recent assessments, scientists have confirmed this projection and indicated that agriculture everywhere in Africa runs some risk of negative impacts from climate change.

A key conclusion in the IPCC Synthesis Report and Summary for Policy Makers¹ was that agricultural production, including access to food, would be severely compromised in many African countries by 2020. This has caused some debate, especially as parts of this conclusion are based on a single study.

In order to evaluate whether the conclusion is still supported by up-to-date scientific findings, the study reviewed more recent climate change impact assessments. It evaluated 14 quantitative assessments including statistical, econometric, and process-based biophysical model evaluations and 6 more descriptive qualitative assessments. These studies had a range of time frames, assumptions and locations. Some considered specific regions, whilst others assessed the impact on the whole continent. Some considered single crops, whilst others looked at the entire agricultural sector.

The broad range of assessments identified a vast range of impacts. In most cases, these included severe negative impacts but often some potential for improvements. Changes in rainfall patterns have the greatest implications for agricultural production although increasing temperatures also play a large role. Floods and droughts put some regions, such as mid-altitude and coastal zones in Eastern Africa, at risk of severe reduction or even total loss of agricultural production. Other regions, such as Nigeria, Uganda and South Africa, could benefit from an increase in rainfall.

Some crops are more susceptible to warming, such as wheat, whereas others, such as millet, are more resilient to increasing temperatures. The qualitative studies also indicated the possibility of more indirect impacts on agriculture, such as erosion and salinisation caused by sea-level rise and an increase in pests and pathogens. There was also a suggestion of larger scale impacts arising from agricultural issues, such as migration, increased poverty and civil wars.

The continent does have potential to increase its productivity -inefficiencies already exist irrespective of climate change, and 'yield gaps' range from 10 per cent for Egypt to 90 per cent for Angola. These gaps can be largely explained by lack of access to market, which reduces access to fertilisers and pest control. It is likely that, climate change will increase production inefficiencies and Africa will continue to struggle to produce adequate food.

Despite the range of studies assessed, there is overall support for the IPCC's conclusion on the impact of climate change on Africa. All of the 14 quantitative studies confirmed the risk that climate change will negatively affect parts of Africa.

However, regardless of the possible positive impacts the consensus is that African agriculture is at risk, which means existing cropping systems will have to change. There is a need for more research on the possible adaptive solutions and strategies to increase resilience in an already vulnerable system. Already there is some support for possible adaptation measures, such as changes in crop mixes, agricultural practice (e.g. conservation tillage), precision farming (including irrigation) combined with increases in imports (although how African societies could generate enough income to buy imports remains unclear), which in turn would require better infrastructure for transport. There also needs to be further investigation into the best ways to provide international support to African societies; international investment in African agriculture may lead to some development and income opportunities, but this may involve giving up cropland to foreign companies or countries, compromising food security.

1. www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

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