

Wet season changes under future climate change could harm 'vulnerable' Africa

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Satellite imagery of Africa. Credit: Public Domain

Later and more intense rainy seasons across parts of Africa due to

climate change could have damaging consequences, a new study has found.

The fourth IPCC (Intergovernmental Panel on Climate Change) Assessment Report states that "Africa is one of the most vulnerable continents to [climate change](#) and climate variability." This is partly due to high dependency on climate, in particular the one or two wet seasons that occur each year.

Scientists at the University of Reading have used a new method to investigate the impact of climate change on these wet seasons. Among other findings, this revealed wet seasons would start later in western and southern Africa in future decades, while rainfall would be more intense and damaging to crops with delicate flowers like cocoa and coffee plants.

Caroline Dunning, lead author of the study at the University of Reading, said: "Shorter heavier rainy seasons will have a direct impact on lives of people living in Africa and the ability to adapt to these changing weather patterns will have a number of implications.

"Suitable adaptation may be required, for example, using crop varieties that can cope with a shorter growing [season](#), altering farming practices to minimise [soil erosion](#) and improved management of rainwater in urban areas to minimise flooding. Other adaptation may be required to protect crops from increasing intensity of rainfall."

Rainfall is projected to alter as the planet warms in response to rising concentrations of atmospheric greenhouse gases. The new research, published in the *Journal of Climate*, indicates future changes in the timing and characteristics of the rainy seasons over Africa with important implications for impacts of climate change on vulnerable societies.

The scientists applied a method they devised in 2016 to climate model simulations for Africa. This analysed seasonal progression of rainfall in Africa to predict the start, end, length and intensity of wet seasons under future climate change.

They found the wet season would start later across much of western and southern Africa. In regions like west Africa, where there was little change in the end date, or southern Africa, where the wet season ended earlier, a later onset made the wet season shorter.

This may be problematic for crops, as a shorter wet season can lead to a shorter growing season and result in crops not reaching full maturity. It could also impact the recharge of reservoirs, the supply of electricity from hydro-power and the lifecycle of mosquitoes, which transmit diseases like malaria.

Across much of central Africa, projections suggest that the amount of rainfall occurring during the wet season will increase. However, over Southern Africa projections show lower rainfall totals, with possible impacts on farming.

The Horn of Africa (Somalia, southern Ethiopia, Kenya and Uganda) and equatorial regions experience two wet seasons per year; one in the northern hemisphere spring (known as the long rains) and one in the autumn (known as the short rains).

The results show the long rains ending earlier, and the short rains ending later. The most notable result, however, is the large increase in the amount of rainfall occurring during the short rains. These changes in seasonal rainfall timing were linked with the summer heat low over the Saharan Desert.

Another important finding was that, within the wet season, rainfall will

be more intense but less frequent. As well as damage caused to crops by heavy rainfall, long dry periods can reduce soil moisture and harden the surface layer, meaning when heavy rainfall events do occur flash flooding and soil erosion is more likely.

Dunning said: "Overall, we found that [climate](#) change will alter the timing of wet seasons over Africa, with shorter wet seasons over southern Africa. Seasonal rainfall totals are projected to increase over central regions, but decrease over southern Africa.

"For the large proportion of the population dependent upon rain-fed agriculture for their income and subsistence, the timing of this wet season and amount of [rainfall](#) is of high importance."

More information: Caroline M. Dunning et al. Later Wet Seasons with More Intense Rainfall over Africa under Future Climate Change, *Journal of Climate* (2018). [DOI: 10.1175/JCLI-D-18-0102.1](https://doi.org/10.1175/JCLI-D-18-0102.1)

Provided by University of Reading

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