

# The future of global agriculture may include new land, fewer harvests

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Climate change may expand suitable cropland, particularly in the Northern high latitudes, but tropical regions may become increasingly unsuitable, according to a study published September 17, 2014 in the open-access journal *PLOS ONE* by Florian Zabel from Ludwig Maximilians University, Germany and colleagues.

Most of the Earth's accessible agricultural land are already under cultivation. Ecological factors such as climate, [soil quality](#), water supply and topography determine the suitability of land for agriculture. Climate change may impact [global agriculture](#), but some regions may benefit from it. In a new study, researchers focused on the probable impact of [climate change](#) on the supply of land suitable for the cultivation of the 16 major food and [energy crops](#) worldwide, including staples such as maize, rice, soybeans and wheat. They simulated the impact of climate change on agricultural production over the course of the 21st century and found that two-thirds of all land potentially suitable for agricultural use is already under cultivation.

The results indicate that climate change may expand the supply of cropland in the high latitudes of the Northern hemisphere, including Canada, Russia, China, over the next 100 years. However, in the absence of adaptation measures such as increased irrigation, the simulation projects a significant loss of suitable agricultural land in Mediterranean regions and in parts of Sub-Saharan Africa. The land suitable for agricultural would be about 54 million km<sup>2</sup> – and of this, 91% is already under cultivation. "Much of the additional area is, however, at best only

moderately suited to agricultural use, so the proportion of highly fertile land used for crop production will decrease," says Zabel. Moreover, in the [tropical regions](#) of Brazil, Asia and Central Africa, climate change will significantly reduce the chance of obtaining multiple harvests per year.

"In the context of current projections, which predict that the demand for food will double by the year 2050 as the result of population increase, our results are quite alarming. In addition, one must consider the prospect of increased pressure on land resources for the cultivation of forage crops and animal feed owing to rising demand for meat, and the expansion of land use for the production of bioenergy," says Zabel.

**More information:** *PLOS ONE* ,  
[dx.plos.org/10.1371/journal.pone.0107522](https://doi.org/10.1371/journal.pone.0107522)

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