

MCC Press Release

Climate change may reduce welfare of Indian subsistence farmers by one third

New MCC study quantifies impacts in the world's second most populous country. Households above the poverty line, however, may even benefit.

Berlin, 05/12/2019. Around 1.4 billion people currently live in India, the world's second most populous country. 270 million of them live below the poverty line – predominantly in rural areas strongly dependent on agriculture. Global climate change threatens to decrease the welfare of poor farming households in particular, and may cost them one third of their consumption by the end of this century. This is the result of an elaborate statistical analysis led by the Berlin climate research institute MCC (Mercator Research Institute on Global Commons and Climate Change), now published in the journal *Economics of Disasters and Climate Change*.

The outcomes result from a causal analysis of historical data, relating consumption of rural Indian households to local temperature and precipitation. This draws on two sources: a high-resolution dataset on Indian weather provided by the European Centre for Medium-Range Weather Forecasts; and a panel dataset from the India Human Development Survey that provides information on the socio-economic situation of approximately 42,000 households in two representative survey rounds conducted in 2004/05 and 2011/12.

"For example, Indian farmers living below the poverty line are adversely affected by a hotter spring and a drier summer, whereas a milder winter might have a positive effect on their consumption," reports [Barbora Sedova](#), lead author of the study and researcher in the MCC working group Economic Growth and Human Development. "However, our study also shows that households above the poverty line are much less sensitive to these changes in temperature and precipitation. They can cope better with the negative fallouts, for instance because they have access to bank loans, assets, or land ownership".

In a second step, the research team combined the estimated relationships between weather and consumption with the Representative Concentration Pathway RCP8.5 of the Intergovernmental Panel on Climate Change (IPCC). In this "business-as-usual scenario" presented in the latest IPCC Assessment Report, no further ambitious policies are adopted to mitigate global climate change, with the global mean temperature increasing by 3.7 degrees over the course of the 21st century.

"The local temperature and precipitation resulting from this scenario would reduce consumption of Indian subsistence farmers by one third by the end of the 21st century compared to a world without climate

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change," Sedova summarizes the core finding of the study. "On the contrary, households above the poverty line are likely to see their consumption increase by approximately 3 percent." Importantly, these numbers only refer to the impact of climate change, independent of for example economic growth, as Sedova explains. "While the inequality implications of climate change across countries have been studied extensively, the within-country implications have received little attention."

About the MCC

The MCC explores sustainable management as well as the use of common goods such as global environmental systems and social infrastructures against the background of climate change. Our seven working groups are active in the fields of economic growth and development, resources and international trade, cities and infrastructure, governance and scientific policy advice. The MCC was co-founded by the Mercator Foundation and the Potsdam Institute for Climate Impact Research (PIK).

Reference of the cited article:

Sedova, B., Kalkuhl, M., Mendelsohn, R., 2019, Distributional Impacts of Weather and Climate in Rural India, *Economics of Disasters and Climate Change*

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