Risk of multiple tipping points should be triggering urgent action on climate change

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A composite image of the Western hemisphere of the Earth. Credit: NASA

To avoid multiple climate tipping points, policy makers need to act now to stop global CO2 emissions by 2050 and meet the Paris Agreement's goal of limiting global warming to 1.5 °C above pre-industrial levels, a new study has said.

Pioneering new research, carried out by the Universities of Exeter, Zurich, Stanford and Chicago, shows that existing studies have massively under-valued the risk that ongoing carbon dioxide emissions pose of triggering damaging tipping points.

The collaborative study suggests that multiple interacting climate tipping points could be triggered this century if climate change isn't tackled - leading to irreversible economic damages worldwide.

Using a state-of-the-art model, the researchers studied the effects of five interacting tipping points on the global economy - including a collapse of the Atlantic overturning circulation, a shift to a more persistent El Nino regime, and a dieback of the Amazon rainforest.

The study showed that the possibility of triggering these future tipping points increased the present 'social cost of carbon' in the model by nearly eightfold - from US$15 per tonne of carbon dioxide emitted, to US$116/tCO2.

Furthermore, the model suggests that passing some tipping points increases the likelihood of other tipping points occurring to such an extent that the social cost of carbon would further increase abruptly.

The recommended policy therefore involves an immediate, massive effort to reduce CO2 emissions, stopping them completely by the middle of the century, in order to stabilize climate change at less than 1.5 °C above pre-industrial levels.

Professor Tim Lenton, from the University of Exeter and one of the authors of the study said: "Irreversible tipping points are one of the biggest risks we face if we carry on changing the climate. Our work shows that taking that risk seriously radically changes policy recommendations. We need to act urgently and globally to meet the most ambitious targets agreed in Paris last December and reduce the risk of future tipping points."

The study is published in the leading scientific journal, *Nature Climate Change*, on Monday, March 21 2016.

More information: 'Risk of multiple interacting tipping points should encourage rapid CO2 emission reduction' by Yongyang Cai, Timothy M. Lenton and Thomas S. Lontzek, is published in the journal *Nature Climate Change*. DOI: 10.1038/nclimate2964

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