

Climate change could undermine children's education and development in the tropics

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Education of children is one of the ambitious goals for sustainable development as a way to alleviate poverty and reduce vulnerability to climate change and natural disasters. Yet, a new study by a University of Maryland researcher published in the April 15, 2019, issue of the journal *Proceedings of the National Academy of Sciences* concludes that exposure to extreme heat and precipitation in prenatal and early childhood years in

countries of the global tropics could make it harder for children to attain secondary school education, even for better-off households.

University of Maryland researcher Heather Randell, lead author who conducted the synthesis study as a postdoctoral fellow at the National Socio-Environmental Synthesis Center, and co-author Clark Gray, of the University of North Carolina at Chapel Hill, found that climatic conditions affect education attainment adversely in multiple ways. In Southeast Asia, which historically has high heat and humidity, exposure to higher-than-average temperatures during prenatal and [early childhood](#) has a harmful effect on schooling and is associated with fewer years of attending school. In West and Central Africa, and Southeast Asia, greater rainfall in early life is associated with higher levels of education. In Central America and the Caribbean, children who experienced more than typical rainfall had the lowest predicted education.

Surprisingly, children from the most educated households were not cushioned from the [climate effects](#), and they experienced the greatest penalties when they felt hotter and drier conditions in early life.

In the study, Randell and Gray investigated the links between extreme temperature and precipitation in early life and educational attainment in 29 countries in the global tropics. The research has implications for determining vulnerability to climate change and development trajectories.

"If climate change undermines educational attainment, this may have a compounding effect on underdevelopment that over time magnifies the direct impacts of climate change," the authors write. "As the effects of climate change intensify, children in the tropics will face additional barriers to education." The authors expected that children from better educated households would fare better, but found instead that climate change could erode the development and education gains in the tropics,

even for better-off households, who have the most to lose as their advantages wear away.

Randell explained that as children in the tropics feel the intensifying effects of climate change, they will face additional barriers to education and this is more evidence of the varied social impacts of climate change. Policies to safeguard children in these exposed populations, for example making sure pregnant women and young children can get relief from [high heat](#) and humidity, or providing heat or drought tolerant crop varieties, could limit long term impacts of climate change, Randell explained.

"While these results may not be directly related to schools, they are important factors in [early life](#) that affect a kid's school trajectory," said Randell. "People rarely think about how kids' education is directly linked to climate. But this is really important given the extent that climate change is impacting extreme weather events. We need to better understand what gains in education are possible, and how [climate change](#) can act as a barrier to achieving the Sustainable Development Goals. We have to take climate into account, plan for it, and design policies to create more resilient populations given that we know climate impacts are going to be worse in the next decade."

Randell and Gray's *PNAS* paper builds on their earlier study published in 2016 in *Global Environmental Change* that found how climate variability competes with schooling in Ethiopia and could lower adaptive capacity for generations.

More information: Heather Randell et al., "Climate change and educational attainment in the global tropics," *PNAS* (2019).

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