

Rainforest Protection Reduces the Number of Respiratory Diseases

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Measures to combat slash-and-burn techniques significantly reduce the concentration of particulate matter in the air

by University of Bonn

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Rainforest protection is not only good for biodiversity and the climate -- it also noticeably improves the health of humans who live in the corresponding regions. This is the conclusion drawn by a current study by the University of Bonn and the Universidade Federal de Minas Gerais in Brazil. In this, the researchers show that measures to combat slash-and-burn techniques significantly reduce the concentration of particulate matter in the air. The number of hospital stays and deaths due to respiratory diseases thus also decreases. The results have been published now in the journal *Nature Communications, Earth & Environment*.

In 2019, almost 70,000 square kilometers of forest were burned in the Amazon region -- this equates to an area the size of Bavaria. Natural fires are normally rare in the damp conditions that prevail there. However, major landowners and landgrabbers often clear huge areas to use them as pastures or for arable farming.

This overexploitation of Brazil's green lung destroys the habitats of many species of flora and fauna and also accelerates climate change. However, the current study also takes into account another consequence that is often not given enough attention: The smoke generated during the fires is an important trigger of respiratory and cardiovascular diseases.

"We have thus investigated to what extent forest protection measures affect the health of people living in the corresponding regions," explains Yannic Damm. The scientist is a member of Prof. Dr. Jan Börner's research group at the Institute for Food and Resource Economics (ILR) at the University of Bonn. He conducted the study together with his ILR colleague Dr. Nicolas Gerber and with Prof. Dr. Britaldo Soares-Filho from the Universidade Federal de Minas Gerais in Brazil.

How does forest protection affect human health?

The Amazon region of Brazil is divided into two different zones: The legally defined Amazon, which follows the borders of the Amazonian states, and what is known as the Amazon biome, which follows the original forest boundary. "Between 2004 and 2010, a whole range of laws were adopted to curb the ongoing deforestation throughout the Amazon region," says Damm. "However, in our study, we concentrated on three measures that exclusively apply within the Amazon biome and came into force from 2006."

The most well-known of these three measures is presumably the Soy Moratorium. In this, globally operating trading companies agreed to no longer purchase soy grown in freshly deforested areas. "As a result, deforestation pressure has measurably reduced," explains Damm. However, the moratorium (along with the other two resolutions investigated) only applies to the Amazon biome, but not to the neighboring Legal Amazon region with a lower protection status.

The researchers made use of this fact: They compared several hundred municipalities on the biome border with neighboring regions that lay outside of this border and to which the three measures did not, therefore, apply. "In this way, we were able to identify what effect the increased protection efforts had on public health," highlights Damm. The group evaluated, among other things, the particulate matter pollution in the air, and analyzed the reasons why people in the investigated regions were taken to hospital or died.

Protective measures save 680 human lives per year

The effects of forest protection measures on each of these parameters were clear. The concentration of fine dust particles in the air fell in all of the investigated regions after 2006. However, this decrease was almost 7 percent higher in the municipalities within the biome borders. The number of hospital treatments and deaths due to respiratory and cardiovascular diseases also fell. Around four million men, women, and children live in the regions in which the three measures were established. The researchers estimate that around 680 human lives in this group were saved each year thanks to the reduced air pollution.

"Our study has two messages," explains ILR researcher Prof. Dr. Jan Börner, who is also a member of the Transdisciplinary Research Area (TRA) Sustainable Futures and the Cluster of Excellence "PhenoRob" at the University of Bonn. "Namely, firstly, that the destruction of the rainforest can be successfully curbed. And, secondly, that this benefits not only the diversity of species and the global climate but also very specifically and very quickly the local population. This is an aspect that is still given too little consideration when assessing protective measures."