Forest fires linked to tens of thousands of avoidable deaths
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"We found that across Southeast Asia, the amount of air pollution produced by these fires is comparable to that from industry, transport, and power generation."

Burning releases harmful pollutants

Across Southeast Asia—an area including Myanmar, Thailand, Cambodia, Laos, Vietnam and south east China—farmers burn forest as a way of clearing land for cultivation or to graze animals, often in the pre-monsoon period, usually in February to April.

During this period, the weather patterns over a large part of the region can result in a temperature inversion, a meteorological phenomenon that prevents smoke and emissions from the fires dispersing, particularly at night or during the early mornings.

The fires generate a range of harmful pollutants, including fine particulate matter known as PM2.5—tiny particles that measure 2.5 microns (where a micron is one millionth of a meter or less). According to the World Health Organization (WHO), the particles are a risk factor in cardiovascular and respiratory diseases and cancer.

The researchers used measurements of air pollution along with computer models to measure the impact of the fires on air quality and the prevalence of disease.

Modeling impact of burning

In all the datasets analyzed, the researchers found the greatest pollution emissions from the burning was coming from the northern region of Laos, Cambodia, Thailand, eastern and western Myanmar, and southern Bangladesh, and with lower levels of emissions in central Myanmar, Thailand, north Vietnam, and south eastern China.

The researchers modeled what improvements
would be seen in air quality if the burning was stopped.

Dr. Reddington said, "This study is the first detailed assessment of the effects of forest and vegetation fires on air quality and human health in Southeast Asia.

"The study shows that air pollution from vegetation and forest fires seriously degrades air quality in Southeast Asia and that by preventing these fires, exposure to harmful air pollutants could be substantially reduced and many premature deaths could be avoided.

"Furthermore, it shows that the poorer populations of Southeast Asia are being disproportionately exposed to the air pollution from these fires."

New efforts are now needed to reduce forest fires in the region.

Dr. Reddington added, "A complete ban on the use of fire may not be practical for many local farmers who don't have any alternative. Pollution emissions are dominated by burning of forests, so there needs to be increased effort to reduce fires associated with deforestation.

"Reducing deforestation reduces emissions of carbon dioxide and is a crucial element of efforts to slow global climate change. Our work demonstrates that reducing deforestation and associated fires would also lead to cleaner air and improved public health.

"These local and regional benefits may provide a powerful incentive to reduce deforestation. Increased support for community-protected forests and other protected areas, where forest clearance fires are less prevalent, are an important way to reduce fires."

The paper, Air pollution from forest and vegetation fires in Southeast Asia disproportionately impacts the poor, is published in GeoHealth.

More information: Carly L. Reddington et al, Air Pollution From Forest and Vegetation Fires in Southeast Asia Disproportionately Impacts the Poor, GeoHealth (2021). DOI: 10.1029/2021GH000418