

Toxic smog over South East Asia killed over 100,000 in 2015

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Last year, between late June and the end of October, a toxic haze smothered large parts of South East Asia, as a result of Indonesian forest fires, largely in Sumatra and Kalimantan. A recently released study estimated that around 100,300 people have died prematurely as a result of the fires, with many more affected. The figure is the mid-point in a range that puts the toll as low as 26,300 and as high as 174,300.

The study by scientists from Harvard University and Columbia University, published in the journal *Environmental Research Letters*, estimated that the number of deaths across the region was: 91,000 in Indonesia; 6,500 in Malaysia and 2,200 in Singapore.

The estimates were calculated through a complex analysis, focussed on the impact of the fine particulate-matter in the smog on the health of adults, rather than trying to examine the effect of all the toxins present. The figures have not yet been confirmed by an analysis of the official data on mortality.

Winds carried the haze across densely populated areas, including in Indonesia, the Malaysian peninsula, Brunei, Singapore, Thailand and Vietnam. The haze also affected parts of Cambodia and the city of Cebu in the Philippines.

The study indicates that the level of air pollution caused by the 2015 fires was the worst on record, exceeding even that of 1997. The air pollution and number of premature deaths was more than double that of another extreme haze event in 2006. The toxic smoke causes widespread respiratory, eye and skin ailments and is especially hazardous for the very young and the elderly.

In 1997, there were 10,800 known deaths from cardiovascular disease attributed to the smoke in the air, but the actual death toll is likely to have been far higher.

The study said the fires were lit in large part by Indonesian and Malaysian companies, particularly those involved in palm oil production. The two nations account for 85 percent of total global palm oil production between them, making \$18.4 billion in profit in 2014. Indonesia is currently the largest producer and exporter of palm oil worldwide.

Plantation companies have signed no burn pledges and blame impoverished farmers and small-scale operators for the illegal burning. Uncertain land ownership obscures responsibility for the fires, as does the use of contractors and sub-contractors for clearing land.

Illegal burning is a cheap method to clear land. Companies burn in the dry season, as it is an opportunity to clear more land than usual. Peat lands are drained so that fires can clear native vegetation quickly, to prepare land for pulpwood plantations, logging, paper production and especially palm oil plantations.

Haze events have been an ongoing issue since records of such episodes began in 1972. Haze has occurred with varying intensity every dry season, but these events have become more hazardous in recent years. This coincides with the large expansion of land used for palm oil production. In Indonesia alone, production has increased from approximately 5 million tonnes in 1997 to an estimated 35 million tonnes this year.

The Global Fire Emissions Database reported that the 2015 Indonesian fires generated around 600 million tonnes of greenhouse gases, an amount described as “roughly equivalent to Germany’s entire annual output.” Some 97,000 fires were detected in Indonesia between July and late October 2015, and over two million hectares of forest caught fire, one-third of which were High Carbon Stock peat forests.

The study indicates that, as in 1997, the severe haze in September-October 2015 was an entirely man-made disaster, exacerbated by a combination of El Niño and positive Indian Ocean Dipole (pIOD) weather patterns, both of which delay the monsoon rains and create drought conditions, making Indonesia's forests and peat lands dry tinderboxes.

Peat contains significant combustible organic material and can burn for weeks on end. It releases up to three to six times more fine particulate-matter (PM2.5) than fires that burn on other soils. Particulate emissions are the leading cause of global pollution-related mortality.

The primary standard for unhealthy levels of annual average PM2.5 is 12 $\mu\text{g m}^3$ (12 micrograms [one-millionth of a gram] per cubic meter of air). The study indicated that much of Equatorial Asia is close to this standard in non-haze years—with the annual mean values reported in 2011 to be around 13–14 $\mu\text{g m}^3$ for Indonesia, Malaysia, and Singapore. People living in areas close to fire zones may experience annual average PM2.5 of 50 $\mu\text{g m}^3$.

Through the months of the haze, the average estimated fine particulate-matter exposure was approximately 60 $\mu\text{g m}^3$ across the affected regions. Singapore recorded as high as 182 $\mu\text{g m}^3$ toward the end of September 2015, when the haze was at its worst.

The World Bank released data showing air quality during high burning periods in villages near the fires regularly exceeds 1,000 on the Pollutant Standards Index (PSI). Anything above 151 is regarded as unhealthy and above 350 is hazardous. In Palangkaraya, the capital of Central Kalimantan, readings came close to 2,000 PSI in late September. These are the highest readings ever recorded during the fire season.

The brunt of this environmental and health crisis fell above all on the millions of the working poor across South East Asia, with little or no means to protect themselves. Businesses and schools across the region closed during the haze. Approximately 5 million students were affected by school closures in 2015.

The Indonesian government dismissed the findings of the studies, insisting on the official death toll of just 19. The country's own disaster management agency, however, estimated last October that 43 million people had been affected by the haze and up to half a million

suffered acute respiratory infections.

Yuyun Indradi, a forest campaigner from Greenpeace, told the Australian Broadcasting Corporation (ABC) that the recently-published study underestimated the death toll because it did not include infant mortality. "It would be a more staggering number if that age group was added to this study," he said.

Delvien Nasution, who lost his newborn baby Khadziya one month after she was born, told the ABC that she snored when she slept. "That means it's difficult for her to take a breath ... The doctor said it's OK, but the smoke was getting thicker, so we decided to evacuate her to Banjarmasin.

"After several days in Banjar, her health was getting worse. The doctor said she had been poisoned by the smoke. I believe she was poisoned while she was still in her mother's womb ... The smoke was the strongest factor in her death and if we want to blame somebody, then there is the government's part in it."

Many people are hoping that the study will put pressure on the Indonesian and Malaysian governments to introduce laws to enable action against individuals and entities involved in illegal burning activities. It's clear, however, from the government's slow and inadequate response and the lack of legal action against unlawful burning that corporate profit takes priority over health and environmental degradation.



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