

# New study urges smart targeting of pollution sources to save lives and climate

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Researchers at the Stockholm Environment Institute (SEI) at the University of York have played a key role in a new study that shows that implementing 14 key air pollution control measures could slow the pace of global warming, save millions of lives and boost agricultural production.

The study by an international team, which also included scientists from King's College London and the UK Centre for Ecology and Hydrology, identifies 14 measures targeting methane and black carbon emissions that could slow global mean warming by approximately 0.5°C by 2050. The measures could also prevent between 700,000 and 4.7 million premature deaths each year and increase global crop yields by between 30 million and 135 million tonnes per season.

While all regions of the world would benefit, avoided warming is greatest in central and northern Asia, southern Africa and around the Mediterranean, total numbers of avoided premature deaths are greatest in Asia and Africa and the greatest total tonnage gains in crop production are estimated to occur in China, India and the US, followed by Pakistan and Brazil. Countries in South Asia and the Sahel region of Africa could see considerable reduction in the disruption of rainfall patterns.

The research published this week in the journal *Science* was led by Drew Shindell of NASA's Goddard Institute for Space Studies in New York City.

Dr Johan Kuylenstierna, the Director of SEI at York, said: "All 14 measures are based on existing technologies and can be implemented immediately, so do not require long development processes. The measures maximize [climate](#) benefits but would also have important 'win-win' benefits for human health and agriculture."

Dr Kevin Hicks, at SEI, added: "The motivation for taking action will vary from country to country and region to region. In some, climate change will be the main concern but in others, air quality may well take precedence."

Black carbon, a product of the incomplete combustion of fossil fuels or biomass such as wood or agricultural crop residues, damages human health by entering the lungs and exacerbating a number of respiratory diseases. It also absorbs radiation from the sun causing the atmosphere to warm and rainfall patterns to shift and reduces the reflectivity of bright surfaces, such as ice and deserts, a process that hastens [global warming](#). Methane is a precursor to ground-level or lower atmosphere ozone, a component of health-sapping smog, and is also a potent greenhouse gas. Ground level ozone at current levels also damages plants and reduces agricultural yields in sensitive areas.

Dr Lisa Emberson, of SEI, said: "Ground level ozone is a particular problem in areas such as South Asia which is particularly vulnerable to food insecurity and climate change."

Co-author of the study, Professor Martin Williams from the Environmental Research Group at King's College London, added: "Measures taken now to reduce carbon dioxide emissions will not have any effect on the global climate for another 40-50 years. We have shown that there are things we can do to begin to mitigate the temperature increases already being seen."

“The combination of methane and black carbon measures along with substantial carbon dioxide emissions reductions has a high probability of limiting global mean warming to

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