

# 'Brown Clouds' Are World's Newest Environmental Threat

Friday 14 November 2008, by [HEILPRIN John](#), [TRAN Tini](#) (Date first published: 14 November 2008).

A dirty brown haze sometimes more than a mile thick is darkening skies not only over vast areas of Asia, but also in the Middle East, southern Africa and the Amazon Basin, changing weather patterns and threatening health and food supplies, the UN reported.

The huge smog-like plumes, caused mainly by the burning of fossil fuels and firewood, are known as "atmospheric brown clouds."

When mixed with emissions of carbon dioxide and other gases blamed for warming the earth's atmosphere like a greenhouse, they are the newest threat to the global environment, according to a report commissioned by the UN Environment Program and released Thursday.

*"All of these points to an even greater and urgent need to look at emissions across the planet,"* said Achim Steiner, head of Kenya-based UNEP, which funded the report with backing from Italy, Sweden and the United States.

Brown clouds are caused by an unhealthy mix of particles, ozone and other chemicals that come from cars, coal-fired power plants, burning fields and wood-burning stoves. First identified by the report's lead researcher in 1990, the clouds were depicted Thursday as being more widespread and causing more environmental damage than previously known.

Perhaps most widely recognized as the haze this past summer over Beijing's Olympics, the clouds have been found to be more than a mile (kilometer) thick around glaciers in the Himalaya and Hindu Kush mountain ranges. They hide the sun and absorb radiation, leading to new worries not only about global climate change but also about extreme weather conditions.

*"All these have led to negative effects on water resources and crop yields,"* the report says.

Health problems associated with particulate pollution, such as cardiovascular and respiratory diseases, are linked to nearly 350,000 premature deaths in China and India every year, said Henning Rohde, a University of Stockholm scientist who worked on the study.

Soot levels in the air were reported to have risen alarmingly in 13 megacities: Bangkok, Beijing, Cairo, Dhaka, Karachi, Kolkata, Lagos, Mumbai, New Delhi, Seoul, Shanghai, Shenzhen and Tehran.

Brown clouds were also cited as dimming the light by as much as 25 percent in some places including Karachi, New Delhi, Shanghai and Beijing.

The phenomenon complicates the climate change scenario, because the brown clouds also help cool the earth's surface and mask the impact of global warming by an average of 40 percent, according to the report.

Though it has been studied closely in Asia, the latest findings, conducted by an international collaboration of scientists, reveal that the brown cloud phenomenon is not unique to Asia, with

pollution hotspots seen in North America, Europe, South Africa and South America.

More specifically, researchers found, brown clouds are forming over eastern China; northeastern Pakistan, India, Bangladesh and Burma; Cambodia, Indonesia, Thailand, and Vietnam; sub-Saharan Africa southward into Angola, Zambia and Zimbabwe; and the Amazon Basin in South America.

The enormous cloud masses can move across continents within three to four days. Although they also form over the eastern US and Europe, winter snow and rain tend to lessen the impact in those areas.

An international response is needed to deal with *"the twin threats of greenhouse gases and brown clouds and the unsustainable development that underpins both,"* said the lead researcher, Veerabhadran Ramanathan, a professor of climate and ocean sciences at the University of California in San Diego.

One of the most serious problems, Ramanathan said, is retreat of the glaciers in the Himalaya and Hindu Kush and in Tibet. The glaciers feed most Asian rivers and *"have serious implications for the water and food security of Asia,"* he said.

Monsoon rains over India and southeast Asia decreased between 5 and 7 percent overall since the 1950s, the report says, naming brown clouds and global warming as a possible cause. Likewise, they may have contributed to the melting of China's glaciers, which have shrunk 5 percent since the 1950s. The volume of China's nearly 47,000 glaciers has fallen by 3,000 square kilometers (1,160 square miles) in the past 25 years, according to the Chinese Academy of Sciences.

Soot winds up on the surface of the glaciers that feed the Ganges, Indus, Yangtze and Yellow rivers, which makes the glaciers absorb more sunlight and melt more quickly and also pollutes the rivers, the researchers say.

But the UN, which began studying the problem six years ago, still finds "significant uncertainty" in understanding how brown clouds affect conditions regionally, Ramanathan cautioned.

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