

Climate Change and Global Warming

Global Dimming

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On January 15, 2005, the *BBC* broadcast its weekly acclaimed *Horizon* documentary. This one was about a dangerous phenomenon called Global Dimming.

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Burning of fossil fuels is creating two effects

Two effects of fossil fuel productions are:

- Greenhouse gases that cause global warming
- By-products which are pollutants that cause global dimming

What is global dimming?

Fossil fuel use, as well as producing greenhouse gases, creates other by-products. These by-products are also pollutants, such as sulphur dioxide, soot, and ash. These pollutants however, also change the properties of clouds.

Clouds are formed when water droplets are seeded by air-borne particles, such as pollen. Polluted air results in clouds with larger number of droplets than unpolluted clouds. This then makes those clouds more reflexive. More of the sun's heat and energy is therefore reflected back into space.

This reduction of heat reaching the earth is known as Global Dimming.

Impacts of global dimming: millions already killed by it?

Global warming results from the greenhouse effect caused by, amongst other things, excessive amounts of greenhouse gases in the earth's atmosphere from fossil fuel burning. It would seem then, that the other by-products which cause global dimming may be an ironic saviour.

A deeper look at this, however, shows that unfortunately this is not the case.

Health and environmental effects

The pollutants that lead to global dimming also lead to various human and environmental problems, such as smog, respiratory problems, and acid rain.

The impacts of global dimming itself, however, can be devastating.

Millions from Famines in the Sahel in the 70s and 80s

The death toll that global dimming may have already caused is thought to be massive.

Climatologists studying this phenomenon believe that the reflection of heat have made waters in the northern hemisphere cooler. As a result, less rain has formed in key areas and crucial rainfall has failed to arrive over the Sahel in Northern Africa.

In the 1970s and 1980s, massive famines were caused by failed rains which climatologists had never quite understood *why* they had failed.

The answers that global dimming models seemed to provide, the documentary noted, has led to a chilling conclusion: “**what came out of our exhaust pipes and power stations [from Europe and North America] contributed to the deaths of a million people in Africa, and afflicted 50 million more**” with hunger and starvation.

Billions are likely to be affected in Asia from similar effects

Scientists said that the impact of global dimming might not be in the millions, but billions. The Asian monsoons bring rainfall to half the world's population. If this air pollution and global dimming has a detrimental impact on the Asian monsoons some 3 billion people could be affected.

As well as fossil fuel burning, contrails is another source

Contrails (the vapour from planes flying high in the sky) were seen as another significant cause of heat reflection.

During the aftermath of the September 11, 2001 terrorist attacks in the United States, all commercial flights were grounded for the next three days.

This allowed climate scientists to look at the effect on the climate when there were no contrails and no heat reflection.

What scientists found was that the temperature rose by some 1 degree centigrade in that period of 3 days.

Global Dimming is hiding the true power of Global Warming

The above impacts of global dimming have led to fears that **global dimming has been hiding the true power of global warming.**

Currently, most climate change models predict a 5 degrees increase in temperature over the next century, which is already considered extremely grave. However, global dimming has led to an underestimation of the power of global warming.

Addressing global dimming only will lead to massive global warming

Global dimming can be dealt with by cleaning up emissions.

However, if global dimming problems are only addressed, then the effects of global warming will increase even more. This may be what happened to Europe in 2003.

In Europe, various measures have been taken in recent years to clean up the emissions to reduce pollutants that create smog and other problems, but without reducing the greenhouse gas emissions in parallel. This seems to have had a few effects:

- This may have already lessened the severity of droughts and failed rains in the Sahel.
- However, it seems that it may have caused, or contributed to, the European heat wave in 2003 that killed thousands in France, saw forest fires in Portugal, and caused many other problems throughout the continent.

The documentary noted that the impacts of addressing global dimming *only* would increase global warming more rapidly. Irreversible damage would be only about 30 years away. Global level impacts would include:

- The melting of ice in Greenland, which would lead to more rising sea levels. This in turn would impact many of our major world cities
- Drying tropical rain forests would increase the risk of burning. This would release even more carbon dioxide into the atmosphere, further increasing global warming effects. (Some countries have pushed for using “[carbon sinks](#)” to count as part of their emission targets. This has already been controversial because these store carbon dioxide that can be released into the atmosphere when burnt. Global dimming worries increase these concerns even more.)

These and other effects could combine to lead to an increase of 10 degrees centigrade in temperature over the next 100 years, not the standard 5 degrees which most models currently predict.

This would be a more rapid warming than any other time in history, the documentary noted. With such an increase,

- Vegetation will die off even more quickly
- Soil erosion will increase and food production will fail
- A Sahara type of climate could be possible in places such as England, while other parts of the world would fare even worse.

- Such an increase in temperature would also release one of the biggest stores of greenhouse gases on earth, methane hydrate, currently contained at the bottom of the earth's oceans and known to destabilize with warming. This gas is eight times stronger than carbon dioxide in its greenhouse effect. As the documentary also added, due to the sheer amounts that would be released, by this time, whatever we would try to curb emissions, it would be too late.

“This is not a prediction,” the documentary said, “it is a warning of what will happen if we clean up the pollution while doing nothing about greenhouse gases.”

Root causes of global warming also must be addressed

If we were to use global dimming pollutants to stave off the effects of global warming, we would still face many problems, such as:

- Human health problems from the soot/smog
- Environmental problems such as acid rain
- Ecological problems such as changes in rainfall patterns (as the Ethiopian famine example above reminds us) which can kill millions, if not billions.

Climatologists are stressing that **the roots of both global dimming causing pollutants and global warming causing greenhouse gases have to be dealt with together and soon.**

We may have to change our way of life, the documentary warned. While this has been a message for over 20 years, as part of the climate change concerns, little has actually been done. “Rapidly,” the documentary concluded, “we are running out of time.”

More Information

- The [transcript of the documentary](#) from the BBC web site
- [Frequently asked questions about global dimming](#) article, which accompanies the transcript.
- [Why the sun seems to be 'dimming'](#), BBC, January 13, 2005
- [Goodbye Sunshine](#), The Guardian, December 18, 2003

These are the pages within this section on this web site that you can also read.

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- **Global Dimming**
- [UN Framework Convention on Climate Change](#)
- [Reactions to Climate Change Negotiations and Action](#)
- [Climate Justice and Equity](#)
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- [Carbon Sinks, Forests and Climate Change](#)
- [COP10—Buenos Aires Conference](#)
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“Give a man a fish; you have fed him for today. Teach a man to fish; and you have fed him for a lifetime.” — *Old Chinese Saying*

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