

The weather for war

The official chronicle of China's 'Period of the Three Kingdoms' in the third century leaves little room for doubt: "Those days were a time of great need. The people were starving. Beside themselves with hunger, humans became cannibals and rose up against the authorities." That climate change can trigger civil wars seems to be well documented.

But what the connection might be, and whether warming or cooling is more likely to lead to violence, is unclear. Warmer-than-average periods have been implicated in a rising probability for civil unrest in Africa (Burke, M. *et al. Proc. Natl Acad. Sci. USA* **106**, 20670–20674; 2009), whereas civil wars in China seem to have been fuelled by colder-than-average periods in the Middle Ages (Zhang, D. D. *et al. Hum. Ecol.* **35**, 403–414, 2007).

Now the El Niño climate phenomenon has been brought up as a cause of civil unrest (Hsiang *et al. Nature* **476**, 438–441; 2011). From 1950 to 2004, twice as many civil wars occurred during El Niño years than at other times, and every fifth civil war worldwide occurred during an El Niño period.

Nobody knows when El Niño will develop, but half the global population fears the phenomenon: in an El Niño year, the prevailing winds and weather change not only locally but also at greater distances.

Many countries experience droughts, while others are plagued by torrential rains. Off the western coast of South America, fish stocks disappear. Often, El Niño brings famine. The collapse of various early civilisations, including the Central American Maya and the Cambodian Angkor, has been attributed to El Niño, possibly through droughts.

There could be a modern connection too, according to Hsiang and colleagues. For a 54-year period, the team of political scientists and climate researchers evaluated 234 civil wars in which more than 25 people were killed. More than half of these conflicts left over a thousand people dead. The researchers divided the world into two parts: 93 countries that were affected by El Niño, many located in Africa and South America, and 82 countries that do not fall in its sphere of influence.

The difference was surprisingly marked. In countries that are affected by the weather phenomenon, the number of wars doubled in El Niño years. In the rest of the world, the numbers hardly varied. In fact, even during years when El Niño did not occur, only half as many armed conflicts raged in regions that do not feel the effects of El Niño.

The study raised some controversy. Halvard Buhaug of the Peace Research Institute, Oslo, said that alternative similar



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assessments did not show such a link, and raised the possibility that the correlation between El Niño and civil conflicts within this particular data set could be coincidental. More generally, critics suggest that the relation between wars and the weather is pure speculation unless the effects of climate on society are worked out in detail. That could be difficult. So far, only the scarcity of oil has been shown to cause an increase in the incidence of conflict. No compelling link has emerged between civil war and shortages of other significant natural resources such as mineral wealth, agricultural products, drugs or lumber (Ross, M. *J. Peace Res.* **41**, 337, 2004).

The United Nations have already had difficulties predicting societal developments on the basis of climate forecasts. The United Nations Environment Programme (UNEP) and the United Nations University predicted in 2005 that increased periods of warming will double the number of refugees worldwide by 2010 to more than 50 million. Since then, UNEP has distanced itself from this prognosis. There has been no evidence of an increase in refugee numbers of this magnitude. □

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The journalist's take

We ran an article on the El Niño–war relationship under the headline 'Bad weather causes civil wars', following a discussion in the editorial office about whether the piece could have such a one-sided headline. After all, the research had sparked some controversy over the link between climate change and civil conflict. Most scientists would probably have chosen a different headline, as did the authors of the study who went for 'Civil conflicts associated with the global climate'.

In mass media, however, vague phrases such as 'associated with' are better avoided: Above all, they raise questions. For a scientist, the word 'associated' may express a cautious way of hinting, but not claiming, causality. In contrast, the general public are more likely to perceive it as obfuscation, and ask what the exact

association between climate and civil conflict is.

The paper actually goes beyond its title, and shows that civil wars are more frequent in El Niño years. The authors write that El Niño may "have had a role" in the outbreak of wars, and conclude that "the stability of modern societies relates strongly to the global climate." This is the actual message of the study: El Niño has an influence — it is a contributing cause of civil wars.

Good mass media articles extract and broadcast the most important results contained in scientific studies, with clear language in headlines. Rather than 'El Niño', we used the words 'bad weather' in the title; not all readers know about El Niño, but everyone knows what bad weather is. We opted to use this headline because it reflects the content of the study that the article is focused on.