

East Bay Express

Global Warming Also Triggers Military Conflict

UC Berkeley study shows link between heat and war in sub-Saharan Africa.

By Madeleine Bair

We've heard that climate change will kill the polar bears, eradicate the salmon, and sink specks of land in the Pacific Ocean. Pinning down the effect of global warming on humans has been more difficult. But a team of researchers led by two UC Berkeley economists has done just that.

A study by Cal doctoral student Marshall Burke and professor Edward Miguel, published in last week's *Proceedings of the National Academy of Sciences*, is the first to link global warming to human warfare. Its conclusion is that over the next twenty years, if nothing is done, projected temperature increases in sub-Saharan Africa could lead to more bloodshed and the slaughter of an additional 400,000 Africans in civil conflict. If the legislators stalling a climate agreement in Copenhagen next month aren't sympathetic to Hallmark photos of ice caps and polar bears, perhaps the prospect of more Darfurs will catch their attention.

To reach their conclusion, Burke, Miguel, and colleagues from Stanford, Harvard, and NYU compared temperatures in forty African countries from 1981 to 2002, to violent conflict within those countries.

In Uganda, 1983 was a hot year. It also happened to be the same year rebel armies attempted to overthrow the government, resulting in military repression, hundreds of deaths, and a regional refugee crisis. In 1998, West Africans in Guinea-Bissau suffered unseasonable heat; they also suffered an attempted coup and subsequent civil war.

"On average across these countries, hotter years are associated with much higher conflict," Burke said. Fifty percent higher, in fact.

Burke and his colleagues then applied that factor to twenty climate models to find the increased likelihood of violence. Those models were remarkably consistent in predicting a steady rise in temperature over the next several decades. Combining the historical risk of violence with the future predictions of temperature led the researchers to a possible 55 percent increase in civil war, corresponding to nearly 400,000 additional deaths.

What connects the dots between heat and violence? Agriculture — the dominant source of employment across sub-Saharan Africa.

"You get a hot year, crops yields go down, incomes go down, and farmers become more likely to take up arms," Burke said. In countries whose economy is dominated by agriculture, and where fields rely on rainfall rather than irrigation, the ramifications of weather cannot be overstated.

"When there's a drought year, when crops fail, it puts a tremendous amount of stress on African societies, economies, and households," said Miguel, who heads UC Berkeley's Center of Evaluations for Global Action, and has spent years examining the economic roots of violence in Africa. Earlier this decade, that research led him to western Tanzania, where inclement weather can easily destroy the maize and cotton fields that make up the source of local

income. Miguel compared weather shocks there with a type of violence prevalent in that region — so-called "witch killings," which accounted for half of all murders. "In years where there is extreme weather," he said, "you see a spike in the number of witch killings."

The association between climate and war in Africa, while not scientifically documented until now, is an idea that has been gaining traction in recent years, thanks in part to Miguel's 2008 book, *Economic Gangsters* (coauthored by Ray Fisman), which describes his Tanzania witch-murder study, but also because of dialogue surrounding the Darfur conflict. Two years ago, UN Secretary General Ban Ki-Moon wrote an editorial for *The Washington Post* arguing that the war's roots are more complicated than ethnic tension. "It is no accident," Ban wrote, "that the violence in Darfur erupted during the drought," which saw the disappearance of land for nomadic herders to shepherd their camels.

Just as Ban's editorial was a plea for a long-term solution to global warming, Miguel sees this new study as a cry "for governments to put in place serious adaptation strategies."

He has some ideas of his own. Given the strong link between weather shocks and social catastrophe, aid donors must be more nimble. "They make these long-run investments in schools and roads and other things," Miguel said. "They don't sort of shift around their portfolio based on who needs it the most year to year."

Put simply, donors should pay more attention to the weather. In his book *Africa's Turn*, published this spring, Miguel explains an idea he's termed Rapid Conflict Prevention Support — aid that targets countries experiencing shocks like extreme weather or high commodity prices. "It's like preventative medicine," he said. "When we see the risk of conflict rising, foreign aid institutions should channel aid to the countries that risk violence."

Another adaptation strategy is crop insurance, which the southern African nations of Botswana and Malawi have extended to their farmers. Both are poor, landlocked countries, yet neither nation has engaged in recent violent conflict. "Whether that's a result of this program or something else entirely, we can't really say," Burke said. "But that kind of program looks to be something very useful going forward."

While he hopes his research lands on the desks of donors and policymakers, Burke cautions them against one thing: blaming warfare entirely on the weather. "All we can say is that climate seems to be at least a large trigger for these conflicts that we've seen in recent history, and that those triggers could get worse in the future.

"But if you're Bashir sitting in Khartoum," he said, referring to the impugned president of Sudan, "yeah, maybe he'll misinterpret the study and think that it lets him off the hook. That's definitely not our interpretation."