



WEATHER SHOCK, SLAVE TRADE, AND CONFLICT: EVIDENCE FROM SUB-SAHARAN AFRICA

May 2019 | The Center on Conflict and Development at Texas A&M University

Climate change is affecting human life on every continent; however, certain regions are impacted much more than others. The geography of Sub-Saharan Africa coupled with its history of slave trade have made it more prone to contemporary civil conflict. Both history and geography, individually, can contribute to civil conflict. When these variables act simultaneously a synergistic effect emerges and the consequences are devastating.

RESEARCH FOCUS

Graduate researchers working with the Center on Conflict and Development at Texas A&M University investigated whether or not civil conflict and weather patterns are related. Researchers examined a wide range of geography in Sub-Saharan Africa (SSA) and compared it to historical weather patterns during growing seasons. They then compared the findings with conflict occurrences throughout the region. Research questions included:

- Why do civil conflict events wax and wane over time in the same country or subnational region?
- Is the geography (climate-war) hypothesis true for the African Countries?
- How does the history of slave trade interact with weather shock and the likelihood of contemporary civil conflict?

BACKGROUND

Research has shown the effects that geographic location can have on conflict. Whether it's deposits of natural resources, access to shipping routes, or harsh seasonal climates, aspects of the locale of countries must be taken into account. Many regions in Africa are subject to extreme weather patterns. Periods of extreme drought and heavy rainfall are a common way of life for many people. These weather shocks create shortages in the food supply and can be seen as a factor in conflict. Food scarcity will create feelings of insecurity and can become a life or death issue. Greed and grievance over access to an adequate food supply can incite looting among individuals or tribes, further aggravating conflict. Therefore, the climate of African localities, set by their geography, might contribute to the likelihood of conflict through the adverse and unpredictable weather they often experiences.

Both history and geography, individually, contribute to the outbreak of civil unrest. However, when these variables act simultaneously a synergistic effect emerges. Areas throughout SSA that have a history of slave trade are more likely to experience contemporary civil conflict as a result of weather shock than those without a history of slavery. Understanding the interactions between geography and history matter when identifying the underlying causes of civil conflict.

POLICY RECOMMENDATIONS:

1. Improve agricultural technology

Invest in agricultural technology that is specific to the climate and terrain in SSA. These investments can include irrigation facilities to counteract drought (e.g. solar-powered, drip and center pivot irrigators), agronomic practices and machinery that help conserve soil moisture and nutrients (e.g. no-till planting, multiple cropping, mulching), and crop varieties and seed distribution that offer resilience during adverse weather. Such investments will increase the food supply by making it easier to cultivate more land for production and increase the yields of existing plots despite weather shocks.

2. Agricultural youth education

Educating youth in technology, entrepreneurship, leadership and team skills is an effective tool toward building trust, disseminating improved practices, and transforming agriculture. This in turn mitigates factors that cause conflict. Youth training programs that focus on capacity building, cooperation and governance, will give local communities the skills and attitudes to mitigate the effects of unfavorable geography and history, far into the future.

DATA AND EMPIRICAL APPROACH

In order to prove the climate-war hypothesis researchers examined patterns of weather shock and civil conflict throughout SSA. Two different theories were tested: how did weather variability affect conflict and, if positive, how did the likelihood of conflict react when the history of slave trade was also accounted for? Variables tested included periods of drought or heavy rain during growing seasons, historical agricultural production, and levels of conflict.

Data on within-year growing season weather shock from 27 SSA countries over 1997-2014 was disaggregated and compiled into 62,460 grid cells at the subnational level. Growing season weather shock was calculated using a monthly meteorological index of drought, land use information, and monthly global cropping reports. This data on climate was taken from the Standardized Precipitation-Evapotranspiration Index (SPEI) and is a more efficient measure of weather shock than more aggregative data such as annual rainfall. The data on civil conflict was taken from ACLED (Armed Conflict Location and Event Data) and records on slave exports came from a Nunn and Wantchekon (2011) study. The grid cell findings were mapped to illustrate weather shock occurrences and intensity of conflict within SSA countries. Uganda, Rwanda, Zimbabwe, and Western African Countries were found to have had a greater likelihood of experiencing civil conflict during the past two decades.

In addition to conflict data, researchers also took into account political conditions within the countries. Indices from democracy and rule-of-law were taken from the World Bank's Worldwide Governance indicators, since political stability is shown to decrease conflict. This data was compared to data on seasonal and year-round climate, as well as conflict statistics throughout history.

RESULTS AND ANALYSIS

The climate-war hypothesis was found to be supported by a strong association between growing season weather shock and an increased risk of conflict incidence, onset, and intensity. Contemporary growing season drought is positively correlated with an increased risk of conflict. In fact, the odds of experiencing civil conflict because of growing season weather shock increase by 20%-31%, depending on geographic location. Extreme weather patterns during the growing season for staple crops (e.g., maize, rice, wheat) was found to be much more significant than weather shocks experienced at other times in the year. These results highlight the impact weather can have on conflict. The intensity and duration of conflicts was found to be affected by growing season shocks and significantly increased the time spans.

These positive effects were further tested in conjunction with the previous slave trade analysis and its findings of non-economic channels that influence conflict. Baseline results are positive and statistically significant, suggesting that SSA regions exposed to slave trade are more sensitive to growing season weather shock and therefore more likely to experience intense conflict. An interaction analysis shows that slave trade intensifies the impact of weather shock on conflict and acts as a weather shock multiplier. These results highlight the significance of how geography and

history interact and influence the likelihood of civil conflict through their impact on modern development.

CONCLUSIONS

This study shows the role geography has on the likelihood of conflict. Weather shocks, especially during the growing season of primary crops, can increase the intensity and duration of civil conflict. When these adverse weather patterns occur in regions with a history of slave trade a synergistic effect is created. Many different people and communities throughout SSA depend on agricultural activities for survival. Adverse and unpredictable weather shocks, particularly droughts, hinder crop production and create shortages in both the food supply and household incomes. This loss of food and income will give rise to greed and grievance, which fuel conflict, and add to the mistrust brought about by past slavery.

The key to African development lies in appropriately matching investments in human, institutional, technological, and physical capital to the unique natural capital and cultural capital of the continent. Its natural capital includes not only fertile soils but unpredictable extremes in weather. Its cultural capital includes the spirit to triumph, progress and endure, but also the capacity for mistrust imbued by slavery. Policy makers should encourage donors to invest in improving agricultural technologies and techniques that are specific to the SSA region. Improved technology will give farmers the tools they need to put more land into production and increase the efficiency of their labor. This will mitigate conflict by increasing crop production and therefore the supply of food in the region. Donors should also invest in projects that center around human capacity building, such as educational programs, that provide the technical knowledge and skills to sustain developmental improvements in the long term. Investments are also needed that build trust and capacity for governance through local and national institutions. There is no better place to start than with the youth of the nations, especially rural and agricultural youth.

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