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Rice or riots: On food production and conflict severity across India

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ABSTRACT

In large parts of the developing world agriculture remains a broad economic sector securing livelihoods for large parts of the population. In the discourse on security implications of climate change, effects on agricultural production and food insecurity are frequently claimed to be a plausible intermediate causal connection. Earlier research has linked economic shocks to conflict outbreak but loss of income from agriculture may also affect dynamics of fighting in ongoing conflicts. We identify three complementary processes through which loss of food production may escalate enduring conflicts: lowered opportunity costs of rebelling, increased opportunities for recruitment, and accentuated and more widespread social grievances. Using India as a test case, we investigate how year-on-year fluctuations in food production affect the severity of ongoing armed conflicts. The statistical analysis shows that harvest loss is robustly associated with increased levels of political violence. To the extent that future climate change will negatively affect local food production and economic activity, it appears that it also has the potential to fuel further fighting in areas that already are scenes of chronic conflict.

"If one compares maps of precipitation with those of violence, a disturbing pattern emerges: where drought advances, so do Maoists" (Parenti, 2011, 135).

Introduction

The recent wave of uprisings across the Arab world and beyond has accentuated claims that food insecurity constitutes an important driver of contemporary political violence (Johnstone & Mazo, 2011; Sternberg, 2012). Food shortage and escalating food prices may have multiple causes, including severe drought and resulting crop failure in major food-producing areas. Partly for this reason climate change is viewed with much concern, and diminishing food productivity in response to rising temperatures and increasingly erratic rainfall patterns is frequently cited as a significant threat to societal stability and peace (e.g., Adger et al., 2014; Stern, 2006; World Bank, 2010).

The academic debate on climate change and violent conflict is far from settled. Some claim that climatic events are robustly linked to civil conflict risk whereas others fail to find a systematic connection. Overall, most attempts to synthesize the literature conclude that scientific research to date provides mixed and inconclusive findings (e.g., Bernauer, Boehmelt, & Koubi, 2012; Meierding, 2013). Yet, this debate may be somewhat misplaced as it (1) employs a restricted understanding of 'climate' that is limited to extreme climatic events and yearly deviations from mean conditions (climate variability), and (2) is largely limited to considering climate as a possible trigger of political violence. While the global number of armed conflicts has dropped considerably in recent years (Themnér & Wallensteen, 2013), many active insurgencies have simmered for decades with no imminent prospect of resolution. Even if climate variability and extreme weather events are weakly and inconsistently related to general conflict risk, shifting environmental conditions and their immediate social impacts may affect the dynamics of ongoing fighting. Thus far, this issue has received scant scientific attention. The sole focus on climate variability (although important, it is only one aspect of future climate change) also devalues other effects of global warming (e.g., melting glaciers, instability of the monsoon system) that have the potential to have equally adverse effects on agricultural production and economic performance in the future.

A third limitation with extant research is the near exclusive focus on uncovering a direct, aggregate relationship between climatic events and conflict without considering plausible

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mechanisms and conditions under which a climate-conflict link might materialize. This paper addresses these shortcomings. While precipitation is a good predictor of agricultural production in areas solely reliant on direct rain for farming, it is less good of an indicator in countries that use irrigation and canal systems to regulate water flows and/or depend on groundwater extraction or annual glacial runoff for water supply. In order to maximize generalizability and be more precise in testing the causal linkage, we move beyond using short-term changes in rainfall levels as indicators of economic performance. We focus directly on changes in agricultural food production and how they influence the severity of ongoing conflicts. Informed by the general civil war onset literature, we argue that loss of income from agriculture may affect conflict dynamics through three complementary processes: lowered opportunity costs of rebelling, increased opportunities for recruitment, and accentuated and more widespread social grievances. Absent proper compensation by the state (e.g., through relief aid, food price subsidies, redistribution schemes, crop insurance), these processes will motivate a larger pool of individuals to join and/or support an active opposition movement to redress their grievances, thus increasing the likelihood of violence escalation.

To test this general expectation, we conduct a quantitative analysis of political violence across India since 1980. India is a suitable microcosmos in this context as agriculture constitutes the largest and most important economic sector and the country has been the scene of a number of rural-based insurgencies over the last few decades. The main finding shows that times of low agricultural production are significantly associated with higher casualty figures in ongoing armed conflicts.

On conflict dynamics

What explains temporal dynamics of political violence is analytically distinct from research questions addressed in the bulk of the empirical civil war literature, namely issues relating to causes for the initial outbreak of conflict.[1] Even today, most quantitative work seeks to refine our understanding of how particular pre-war structural and social conditions explain conflict onset (see Blattman & Miguel, 2010 for a review). In contrast, after the surge of state consolidation conflicts in the early 1990s there have been very few *new* civil conflicts breaking out. Instead, inter-annual fluctuations in the frequency of armed conflicts today can to a large extent be explained by cyclical patterns of initiation and failure of ceasefires as well as stochastic processes that cause conflicts to satisfy the inclusion criteria of conventional conflict datasets only in some years (see Themnér & Wallensteen, 2013).

Most research to date that does move beyond onset analysis and investigates the severity of intrastate conflict applies a strictly comparative perspective, looking at aggregate characteristics to understand why conflict(s) in country *i* generated more casualties than conflict(s) in country *j*. For example, Lacina (2006) finds that democracy is associated with significantly fewer civil war deaths than other political systems; Heger & Salehyan (2007) link civil war severity inversely to the size of the ruling elite; whereas Lu & Thies (2011) report that civil wars tend to be more deadly in countries with larger economic inequalities. Shifting focus from host countries to characteristics of the actual conflicts, Lujala (2009) finds that petroleum production and drug cultivation in the conflict zone have opposite effects on battlefield severity whereas Eck (2009) shows that ethnically mobilized conflicts are much more likely to escalate to the level of civil war than are other conflicts (see also Costalli & Moro, 2012). These studies provide important insights into aggregate patterns of intrastate conflict but they are unable to inform us on drivers of temporal dynamics of violence within conflicts.

Partly due to coarse data, the question of what explains variations in casualties over time remains largely unaddressed. Common explanations of conflict outbreak, and indeed of aggregate conflict severity, refer to macroeconomic performance, political institutions, demographic and ethnic characteristics, and resource dependence. With the exception of economic performance and associated processes (e.g. unemployment rate; commodity prices), these factors are either static or change only slowly and are as such poor predictors of short-term variations in conflict intensity. In this paper we propose that changes in food production can exert a systematic and robust impact on conflict severity. Food insecurity and economic shocks are frequently promoted as driving factors in the climate-breads-conflict debate in Western media (Sneyd, Legwegoh, & Fraser, 2013), but they are still largely ignored by the civil conflict scholarship, which instead tends to focus on direct relationships between climatic patterns and violence. In the following sections we first outline central arguments from the environmental security literature linking climatic patterns to armed conflict and then discuss how food insecurity and sudden loss of agricultural income can be important drivers of conflict severity.

Environmental scarcity and conflict risk

Most quantitative work assessing correlations between environmental conditions and armed conflict is theoretically informed by environmental security thinking, which links scarcity of renewable resources to violent uprisings, be it triggered by natural disasters, climate variability and extremes, or environmentally induced migration (Homer-Dixon, 1999; Kahl, 2006). The forthright argument typically describes how climatic anomalies such as droughts, floods or changes in temperature affect state stability via their impact on macroeconomic performance, agricultural output, and livelihood security. Under certain (often tacitly assumed) conditions, this process may increase both opportunities for mobilization and personal incentives to use violence to redress grievances. Examples of studies that pursue this logic include Ciccone (2011), Hendrix & Glaser (2007), Koubi, Bernauer, Kalbhenn, & Spilker (2012), and Miguel, Satyanath, & Sergenti (2004) although the overall conclusions from this literature is mixed (Bernauer et al., 2012; Gleditsch, 2012; Meierding, 2013; Scheffran, Brzoska, Kominek, Link, & Schilling, 2012; Theisen, Gleditsch, & Buhaug, 2013).

Apart from the mostly inconclusive empirical evidence for a general climate-conflict association, a striking feature about the literature is its near complete lack of attention devoted to possible impacts of changing environmental conditions on the dynamics of conflicts: whether and to what extent impacts of climate extremes affect the severity of fighting. Yet, some idiosyncratic evidence suggests that climate change may “aggravate numerous existing conflicts” (Gupta & Dutta, 2009, 40) even if climatic conditions by themselves have little influence on the risk of new organized violence, so this should be subject to more systematic scrutiny.

Environmental stress and conflict severity

The dynamics of severity — how conflicts escalate and contract over time — are contingent on several factors. First, conflict severity depends on the actors' motivations and opportunities for sustained combat. As the sides recruit additional supporters, become better armed and organized, receive more support by the local population, and become increasingly committed to the cause, military battles are likely to become fiercer (Lacina, 2006; Weinstein, 2007). Conversely, conflicts tend to fade as popular support for the rebels wanes and the opportunity cost of protesting and fighting the government increases. Second, the course of conflict depends on