Climate Shocks and Governmental Responses, Building a new Dataset

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Motivation

Global climate change is projected to generate wide-ranging impacts on ecological and human systems, from coral reef and species loss, to agricultural and human health effects. Communities in the Global South are expected to bear the brunt of the consequences of climate change, while richer nations shoulder far greater responsibility for adding carbon to the atmosphere (IPCC, 2014). In Africa, for example, communities are expected to face a high risk of reduced water availability and drought, crop failure, and changes to the geographic range and incidence of vector and water borne diseases (Lobell et al., 2011; IPCC, 2014, p 21). How will climate change impact human political and social conditions? How might these impacts fall unequally among different identity groups and how might those differences influence political outcomes? How can international actors, governments and local communities respond, to increase resilience and equity and prevent the worst of these outcomes? Following recent climate accords like the Paris Agreement and, we expect, as new agreements get hammered out at the upcoming COP 27 in Sharm El-Sheikh, Egypt, wealthier countries and international organizations will be increasingly directing funds towards supporting less-wealthy countries in their climate adaption and resilience efforts. My anticipated work is intended to provide an informational foundation for helping to guide those funds towards their most valuable ends.

Research into some of the most dire human consequences of climate change: violence and civil or communal conflict, has generated a robust debate in recent years (Hsiang et al., 2013; Buhaug et al., 2014). Meta-analyses of climate-conflict links suggest a large, causal relationship: that rising temperatures and other climatic extremes will increase interpersonal and, in the Global South, inter-group conflict, relative to counter-factual un-warmed worlds (Burke et al., 2015). While the main effects of temperature and precipitation extremes on conflict appear to be positive, they exhibit considerable heterogeneity in their strength, and even direction, across contexts (Theisen et al., 2011; Salehyan and Hendrix, 2014; Burke et al., 2009; O'Loughlin et al., 2012). These

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effects are likely to depend on a range of human factors that can provide resilience to adverse environmental conditions, or staunch the rise of violence when social stability is perturbed (Fetzer, 2019; von Uexkull et al., 2016; Moscona et al., 2018). Moreover, the existence of such overall effects must implicate one or more causal mechanisms connecting climatic factors to violent outcomes.

The notion that climatic factors could contribute to conflict risk, or directly drive conflict, depends on those factors having an impact on potential conflict actors. If, for example, such impacts could be fully mitigated, e.g. farmers could be fully compensated for their losses during a flood, or pastoralists could earn work and income or receive food equivalent to what was lost in a drought year, then we would expect negative outcomes of those impacts, like conflict, to be avoided. To make sure the government and international responses to climate shocks can best approximate this impact mitigation, aid or other resilience support has to be sufficiently provided and targeted at individuals and communities most exposed to the shock. This may not be the case. Resources might be provided to geographically easier to access recipients who may not be the most in need. Extensive literature in the climate-conflict space suggests that resources–both responsive aid and underlying public goods–may be better provided to areas inhabited by politically better-connected (in the literature, often ethno-linguistic) groups, leaving less connected groups to fend for themselves (von Uexkull et al., 2016). The local political economy, we would expect, helps to channel resources for climate resilience. Where these are poorly targeted from a climate impacts standpoint–where groups that are most in need do not receive sufficient support–this may increase the likelihood of conflict by increasing grievances or leaving farmers and herders more vulnerable to recruitment into armed groups and violent activities (Detges, 2016).

If warming is increasing the likelihood of violence, two approaches will be necessary to mitigate climate change's most hostile effects. First, we need to understand the causal mechanisms, identifying links in the causal chains that connect climate to conflict. Policymakers can then craft effective interventions that block one or more of those links. Second, we need to identify the moderators that enhance or suppress the influence of climate on conflict. Policymakers and administrators can then more effectively determine the countries, regions or individuals that are most vulnerable to climate-related violence. Together, they can optimally target those interventions towards those most vulnerable areas or individuals. The combination of effective policy, informed by greater knowledge of causal mechanisms, and effective targeting, informed by

increased understanding of effect moderators, can successfully reduce the likelihood that climate change leads to violence. But what are the kinds of interventions available to national governments, or to international organization (e.g., United Nations, World Bank) or foreign government funders (USAID, FCDO), in response to climatic shocks and stressors? And how effective are different types of interventions at reducing the propensity for conflict and other human security impacts in a hostile climate?

While the literature on climate-conflict links has grown dramatically in recent years, many of its recent advances take as given the conditions of communities and governments facing climate threats and identify how these conditions moderate the likelihood of violence. Increasing consensus has formed around the importance of, for example, "ethno-political exclusion" (von Uexkull et al., 2016), dependence on rainfed agriculture (Harari and La Ferrara, 2018) and state capacity as related to regime type (Jones et al., 2017). But modeling these moderators as exogenously given misses essential political and social processes that will help to determine the influence of climatic conditions on human affairs. Political exclusion is a choice (Roessler, 2016); water infrastructure can be enhanced (Detges, 2016); regime type and state capacity can vary over time (Acemoglu and Robinson, 2006). Climate impacts are generated by dynamic and strategic processes in which political actors anticipate climatic shocks and stressors and act to prepare (e.g., establishing national social insurance programs like India's NREGA or Ethiopia's PSNP), or these shocks occur, and these actors respond (e.g., the World Food Program providing aid in response to drought or, adversely, governments responding to protests over rising food prices with repression).

There remains an outstanding need to more comprehensively document the kinds of "tools" used by international actors and governments to respond to climate shocks. We lack important descriptive evidence about whether major climate shocks typically garner a response from international or national actors, how big those responses are, and which actors are typically involved, among other questions. Some responses to climatic conditions are more ad-hoc, with international actors rallying after a major drought has begun to provide aid and support. Others are more systematic, like the PSNP, with institutions and administrative capacity built up ahead of time to provide aid when needed. Which of types of responses, the ad-hoc food aid or the long-term social safety net, are more efficient in terms of meals provided or lives saved per dollar? Which tend to be more equitable or just in their distributional impacts? And what factors explain variation in

kind and degree of response to similar shocks?

Filling the gap with a new dataset

Gathering data on the full range of pre- and post-shock tools that have been historically used by national and international actors will begin to fill this gap and allow for new analysis into the most effective policies and practices for justly and equitably managing the stressors associated with global climate change. Ideally, this dataset construction endeavor will come about through collaboration among natural and social scientists as well as practitioners at international organizations and foreign aid agencies. I would work with climate scientists to build the set of relevant climate events; and seek collaborations with experts on governance and international responses to disasters to identify the set of relevant responses. In addition, I would seek to engage with practitioners in New York and Washington, D.C. at the UN and World Bank, as well as USAID, the IMF and other international and foreign aid organizations to learn from their insights.

Where possible, this work will draw from existing datasets and relevant efforts, such as the Dartmouth Flood Observatory (Brakenridge, 2022) and adaptation action reviews like Turek-Hankins et al. (2021). It draws inspiration from but has important distinctions from major existing disaster datasets like EM-DAT (Guha-Sapir et al., 2022). Most importantly, EM-DAT utilizes problematic variables as inclusion criteria for events in the database, like whether there was an international response or a state of emergency declared (Lesk et al., 2016). These are precisely the kind of variables I would like to study as outcomes or moderating variables of interest, so using them to select cases would inevitably cause bias. My dataset construction process instead would involve starting with first principles about the kinds of climatic events that seem relevant to human outcomes and that are expected increase in importance under climate change. In collaboration with the climate science side of my interdisciplinary team I would work to define and then collect information on the universe of relevant stressor/shock cases. Then, in conjunction with scholars who are experts on international organizations, foreign aid, security and the political economy of development, I would work to identify and define the relevant set of national and international actor "tools" for handling climate stress, and set up protocols to begin collecting data on when and where those tools have been used. I would begin with a small scope, collecting data from the

past 20 years, across Sub-Saharan Africa (possibly starting even smaller: only the Sahel region), and later expand the dataset in geographic scope and time. These data would then allow for a set of individual studies aimed at identifying effective approaches and making recommendations for governments and international actors that seek to address climatic stressors and prevent conflict, famine and other harms into the future.

Putting the data to use in specific studies

Here I describe a couple of possible studies (out of many) that could be completed once the descriptive data have been collected.

Study 1: Introducing the dataset and identifying descriptive trends in national and international climate shock responses. This paper would provide an introduction to the dataset and suggest potential uses. First it would present descriptive trends in the data. These would include documenting the range of existing anticipatory actions and responses, and showing how often particular tools are used, how large interventions tend to be, what institutions are involved, and how these facts have changed over time or vary by region. The study would then outline possible uses for the data. These would include, among others: a) econometric cross-country analysis, b) identifying relevant cases for in depth country- or region-specific quantitative or qualitative analysis of climate impacts and resilience, and c) conducting qualitative elite-interview based analysis to trace political process that can explain why some climate shock cases saw stronger responses than others.

Study 2: Social safety net programs and resilience to climate-related conflict. This paper would use the dataset to select African country cases that seem most relevant for studying the influence of large-scale social safety net programs on climate resilience. These would include: a) a major and ideally spatially-varying shock, b) a social safety net program in place for some of the relevant historical time period and c) panel-structure social and economic data collected both before and after the shock, such as from the LSMS-ISA and/or DHS surveys from the World Bank. If possible, I would select 3-5 such cases from the region, run analyses individually within each country and then pool the analyses into a cross-country meta-analysis.

Anticipated outputs and timeline

Dataset building: *Year 1:* The goals for the end of Year 1 will include: 1) in collaboation with my full interdisciplinary team and contacts at international organizations and NGOs, clearly define the variables of interest for the dataset for both climate factors and political action; and 2) set up data collection protocols to begin collecting data. *Year 2:* 3) Complete the dataset for the past 20 years in Sub-Saharan (or Sahelian) Africa.

Study Analysis and Writing: *Year 2:* 1) Craft a manuscript for Study 1, an introduction to the dataset and descriptive statistics/trends. 2) Begin data analysis for Study 2. *Year 3:* 3) Complete data analysis for Study 2. 3) Craft manuscript for Study 2.

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