RESEARCH STATEMENT

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I am an economist with specializations in environmental, development, and political economics. My interest in these overlapping subjects is motivated by an overarching curiosity about and concern for how economic and political systems jointly determine and allocate social welfare under conditions of economic scarcity, institutional incapacity, and social disparity. Naturally, much of my attention has gravitated towards the global challenge of climate change, studying how the welfare impacts of unprecedented environmental pressures are distributed through political economic systems which tend to reproduce, reinforce, and reify patterns of inequality.

My research to date has been primarily empirical, requiring a unique interdisciplinary skillset to work with diverse and unusual forms of data. The nature of my work necessitates that I draw from diverse subfields within economics and depend on collaborations across the social and environmental sciences. As such, I have experience working productively with climate scientists, computer scientists, a political scientist, and fellow economists and have co-authored research published in *Nature* and *Science*, two high-impact interdisciplinary outlets.

1 Climate impacts and social welfare

Understanding how climate change impacts are globally distributed is critical to the design of equitable and politically viable climate policy. Yet where evidence of this relationship is available, analysis is generally limited to coarse comparisons of country-level aggregates, remaining agnostic to more pertinent disparities across persons inhabiting those countries. My job market paper, **"Global income distributions under climate change"**, advances this literature using newly available distributional income data to incorporate understudied within-country dimensions of this climate inequality. First, I document new evidence that temperature shocks persistently exacerbate inequalities within countries by disproportionately reducing income growth among the lowest income-earners, especially in warm-climate economies. Second, I use these empirical results to compare the historically observed distribution of global income to its counterfactual distribution had global warming been stabilized at 1980 levels. I estimate that systematic warming between 1980-2016 increased global income inequality by 4.0% [1.6,6.6], with absolute increases in between-country and within-country inequality contributing equally to this total effect. These contributions in turn correspond to proportional increases in inequality of 2.6% [0.0, 5.6] within countries and 8.7% [4.9, 13.3] between countries. To my knowledge, these distributional results constitute a novel contribution to the climate impacts literature and altogether offer the most comprehensive evidence yet of the globally regressive economic impact of climate change.

This emphasis on decomposing aggregate impacts follows from earlier climate policy-oriented work co-authored with the economist Marshall Burke and the climate scientist Noah Diffenbaugh and published in *Nature*. In **"Large potential reduction in economic damages under UN mitigation targets"**, we present a probabilistic framework for assessing aggregate economic impacts of anthropogenic warming. Our construction decomposes uncertainty associated with mid-century and end-of-century economic projections into distinct sources associated with i) econometric estimation of the economic effects of environmental change, ii) climate models of the spatial distribution of anthropogenic warming, iii) the projected schedule of greenhouse gas concentrations associated with a given level of radiative forcing, and iv) the social discounting regime of choice. We apply this framework to characterize the economic benefits of climate policy, emphasizing how achieving the most ambitious mitigation targets of the 2015 Paris Agreement would obviate essentially certain economic calamity that will otherwise concentrate in developing countries.

2 Environmental political economy

Despite widespread regard of climate change as a threat to global stability, its political consequences remain undertheorized. In **"Temperature, institutions, and the political climate"**, I derive two competing

hypotheses by repurposing influential theories of demand-led political transition. The first posits that adverse environmental shocks reduce the opportunity cost of contesting autocratic governance, improving prospects for democratic reform. The second instead suggests that these shocks are better understood as exceptional crisis conditions which motivate citizens to compromise negative liberties for security more credibly assured under states of emergency, thereby diminishing democratic institutions.

I test these hypotheses first by measuring the dynamic impacts of identified temperature shocks on survey-based proxies for the demand for democracy. I then study how these shocks affect the quality of political institutions as measured by commonly used multi-valued and dichotomous measures of democracy. Results indicate that an economically adverse 0.5°C shock temporarily reduces the likelihood of autocracies undergoing democratic transition by 1.5–3.7 percentage points. The same shocks increase the probability of democracies undergoing reversal by 0.6–2.0pp in a representative 26° democracy but has no discernible effect on a 10° democracy. I interpret these results as evidence supporting the latter "state of emergency" hypothesis while also suggesting that sufficiently credible state capacity may insulate democratic institutions from environmental disruption.

In **"Evidence of a drought effect on the hazard into spousal violence"**, the political scientist Tanushree Goyal and I explore how income shocks impact the probability that a previously non-violent marriage becomes violent. We combine high-resolution weather data with comprehensive duration data derived from household surveys of domestic violence in India to characterize these dynamics. Preliminary findings suggest that drought-induced shocks of a magnitude expected once every 4-5 years reduce the annual hazard into first-time intimate-partner violence by 70% in the formative years of a marriage. These results are broadly consistent with recently published evidence that local droughts reduce the incidence of other gendered cultural practices such as child marriage and female genital cutting. This project is part of a broader interest in an emerging historical political economy literature on cultural transmission and anti-persistence.

3 Future Research

My near-term research plans largely entail building on these promising themes. Ongoing work seeks to extend my job market paper by explicitly disentangling the contributions of geography, pre-existing inequality, population, and development to the global regressivity my counterfactual analysis revealed. I expect to incorporate these new results shortly before submitting this revision to a top journal within the next two months. I am also currently in communication with researchers at the World Inequality Lab about collaborative work that builds on my job market paper to highlight its implications for structural policy.

The benefit of breaking ground on a topic of wide policy interest is that there is no shortage of directions to take future work. In the medium term, I aim to build on these findings to more formally highlight its implications for equitable and politically viable climate policy. One promising line of research might draw from the directed technical change literature to establish overlooked complementarities between carbon pricing, fiscal redistribution, and industrial policy to theoretically derive conditions identifying optimal policy mixes. Another approach may focus on its implications for political feasibility, combining these new empirical results with experimental work relating perceptions of the regressivity of carbon pricing mechanisms to its political acceptability. Beyond this climate impacts work, I intend to follow the recommendation of my dissertation committee by preparing my climate-institutions paper for submission to a top economics or political science journal by the end of the year.

In the longer term, I plan to diversify my research portfolio by establishing firmer footing as a development economist. Discussed extensions of my collaborative work on gender norms would involve original survey data collection to better understand the complexities of intimate-partner violence and the cultural context of these gendered practices. I am particularly interested in designing research that maintains ethical commitments to the relatively powerless subjects of my study while remaining methodologically rigorous.