

Erin Litzow – Statement on current and planned research

My research focuses on human-environment interactions and their consequences in low-income settings. In my work I am inspired and guided by three principles. The first is to conduct research that **directly informs current policy problems and questions**. My job market paper is an example of this, studying the costs of lead (Pb) pollution exposure in Mexico from used lead-acid battery recycling. Lead pollution exposure, like many other environmental hazards, is disproportionately high in low- and middle-income countries (LMICs), whose populations bear an estimated 90% of the global burden of lead exposure. The pollution I study in Mexico is a direct result of a tightening of U.S. environmental standards, shifting battery recycling activities from the U.S. to Mexico. I estimate the cost of this pollution on recipient communities in Mexico and find that it negatively affects learning outcomes. Effects are heterogeneous; pollution exposure is especially harmful for already marginalized populations. The results of this work shed light on the costs of lead pollution in LMICs, where large-scale causal studies are rare, and can inform the design of regulatory measures to address this challenge. Toxic exposure to lead and other heavy metals in LMICs is expected to increase as rich countries introduce stricter environmental regulations and our collective reliance on heavy metals increases with the global energy transition. Thus, this area is ripe for ongoing, policy informing research. In the future I hope to work with interdisciplinary teams of researchers to map lead pollution exposure and associated risks more precisely. I also plan to use experimental and quasi-experimental methods to design and test industry and household-level policies that can reduce lead pollution exposure and mitigate effects in already-polluted communities.

Second, I believe that **hands-on, field-based engagement** is an important part of studying questions at the intersection of environment and development. Primary data collection, of many forms, is a necessary input to much of my research. Secondary economic and environmental data is often collected infrequently and insufficiently detailed. In my second dissertation chapter, published in the [World Bank Economic Review](#), I use data collected via phone survey during the COVID-19 pandemic to document how female firm owners are differentially affected during demand shocks, shifting into unemployment while their male counterparts are able to substitute for lost income. Documenting these trends would not have been possible without the detailed individual- and firm-level panel data we collected. Primary data also allows researchers to understand complex individual and household level decision making processes. My final dissertation chapter is motivated by the household production model that I outline in this [Handbook of Environmental Economics chapter](#). The model considers households as “producers” of environmental quality, choosing their investments in averting technologies and behaviors. In this work I evaluate the role of intra-household bargaining, measured via a lab-in-the-field game, in adoption of often gendered technologies like improved cookstoves. In upcoming experimental research, I am collaborating with engineers to install appliance-specific smart meters in houses to collect precise, high frequency data on energy and appliance use.

Finally, I rely on data and methodologies that allow me to **identify causal relationships while maximizing the external validity** of my findings. In my job market paper discussed above I use nationwide data on battery recycling plant location, school location, and test scores. I apply a

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spatial difference-in-difference framework to account for endogeneity of pollution exposure and overcome the lack of pollution monitoring data, a common hurdle when studying environmental questions in LMICs. These data allowing me to estimate the total cost of this lead pollution exposure channel borne by Mexico's school-age children. In an analysis of Bhutan's electricity grid extension efforts, published in [*World Development*](#), I relied on nationally representative household data and matching methods to identify the impacts of electricity access at a national scale. I considered a diverse set of outcomes and estimated the economic, social, and environmental benefits from expanded electricity access. Conducting similar studies across different contexts can also increase external validity of findings. The intra-household bargaining project mentioned above is conducted in four African countries, as part of a larger evaluation of the effect of improved cookstoves on women's time use and overall empowerment.

As I look forward, my upcoming research projects continue to be guided by these principles. I was recently awarded a 70,000 USD grant to undertake a cross-country analysis of electric cooking appliance adoption in Ethiopia, Kenya, and Uganda. In the study, conducted in collaboration with policy makers and scholars in the three countries, I will investigate how appliance subsidies and recently updated tariff rates affect appliance adoption and use and the subsequent effect on the electric grid. The results of these studies will directly inform electric cooking policies, like Rwanda's Scaling-Up Energy Access project. I will continue to conduct collaborative, policy-informed research in my future career, and will work hard to support students and colleagues from the Global South in accessing research networks and funding opportunities. I am excited to support the growing diversity in our field, collaboratively unlocking new lines of inquiry and producing knowledge aimed at protecting our planet while we seek to end global poverty.