Aparna Howlader - Research Statement

Summary. I am an environmental and natural resource economist. My research focuses primarily on the relationship between land policies and inequality. I study the implications of both historical and current land policies, including effects on environmental and agricultural outcomes, labor markets, climate resilience, and overall human welfare. My research also illuminates the role of local communities and pre-existing institutional conditions for determining the evolution of outcomes following the instating and enforcement of these land policies. I investigate how effects vary among different subgroups of the population. Additional projects focus on urban land policies and housing inequality, especially rental dynamics and eviction in the United States. I have also studied the implications of modern portfolio theory in designing spatial land conservation policies under climate uncertainty. My work is primarily empirical, and I use both observational data and compilations of archival information on historical land management to arrive at my conclusions.

Long-Term Effects of Historical Land Conservation Policies. Much of my current research is devoted to studying how early land conservation policies in the United States affected later economic and environmental conditions. My work included digitizing and building new databases based on the historical reports of soil conservation districts available in the National Archives and Records Administration at College Park.

Post-Dust Bowl farmland conservation policies included land retirement and land conservation activities. In my paper "Environmental Recovery after the Dust Bowl: Implication of Land Conservation Programs in the Great Plains", I study post-Dust Bowl historical land conservation policies, especially those related to land restoration. These sorts of policies take significant time to reveal any detectable effect on environmental quality. To assess the short- and long-term effects of land conservation programs on counties in the United States, I evaluate the farmland conservation programs from its introduction. I show that present-day differences in environmental outcomes within the Great Plains can be traced to post-Dust Bowl farmland conservation activities. Using spatial and temporal variation, I identify that these policies had considerable immediate effect on the agricultural landscape, and that spatial heterogeneity in the impacts depends on agricultural land tenancy, access to irrigation, and institutional and political factors. Also, my research shows that the initial conversion of the land through many institutional changes has had persistent effects on long-term soil erosion. Using the discontinuity of the policy for some years, I demonstrate that the likelihood of grassland restoration by landowners significantly decreased when federal subsidy was eliminated.

My second essay also focuses on post-Dust Bowl conservation, but I study underlying factors driving the formation of environmental organizations in my paper "Understanding the Formation of Local Environmental Institutions: Historical Evidence from the Timing of the Conservation Districts" . Recent theoretical work on local institutions and natural resource management suggests that we can enrich our understanding of local institutions by identifying factors that drive people to cooperate. I test this theory by compiling a historical database for a long-lasting local institution in the Great Plains: Soil Conservation Districts (SCD). I estimate the effects of ecological heterogeneity, climate uncertainty,

and agricultural variations on the formation of these local institutions. Using a dataset for the period 1936 - 1957, and employing multilevel discrete survival models, I found that the likelihood of creating an SCD is high in higher erosion areas. Further, I establish that SCDs were much less likely to form in highly intensive drought regions. I also show how farm-specific spatial heterogeneities—such as tenancy, access to irrigation, access to conservation projects, number of farms, and access to demonstration plots — affect the formation of SCDs.

I am currently using my database to estimate the impact of post-Dust Bowl conservation policies on human welfare and climate resilience in a paper titled "The Role of Local Institutions in Climate Resilience: Historical Evidence from Soil Conservation Districts in the Post-Dust Bowl Great Plains Region". I examine the role of local institutions in natural resource management, especially in the context of soil conservation and climate resilience after the Dust Bowl. Using an identification strategy based on historical institutional settings, and relying on exogenous temporal variations in patterns of government conservation funding allocations (annual conservation budgets) and spatial variations in the conservation information dissemination process (associated with the location of demonstration plots), I explore the effects of conservation institutions in the mid-20th century on per-acre crop yield loss due to the next rounds of weather shocks.

I also study the relationship between soil erosion and shelterbelt areas in "Determinants and Consequences of Agroforestry: Historical Evidence from the Great Plains Shelterbelt Project". Private farmland conservation, especially agroforestry, is widely used as a land conservation instrument all over the world. This paper examines the determinants and consequences of the adoption of large-scale tree plantation projects on farmland using the experience in the Great Plains Shelterbelt Project in the late 1930s. I show how market pressure influenced tree planting and how long term soil erosion has been persistently changed because of the presence of trees. Identification exploits world market price movement, initial crop production intensity, and the geography of the planned 100-mile wide shelterbelt project. The main finding is that increases in world market price decreases the adoption of shelterbelt trees in these years , and agricultural institutions such as tenancy, access to irrigation, duration of the agricultural contract matter in the decision process. Finally, shelterbelt adoption decreases long-term wind erosion, especially in the pasture areas.

I have several other ongoing projects in this research area examining other dimensions of historical and contemporary farmland conservation policies in the United States, especially effects on demographic change, spatial targeting of land conservation, and water quality.

Implication of Land Conservation Policies in Developing Countries. I study environmental issues in developing countries. My work provides new insights into previously unexplored mechanisms for the impact of land conservation policies in developing countries. My research motivation is to understand heterogeneity in the impact of these policies and the mechanisms by which people react to conservation policies. Subsequently, we can develop optimal conservation policies with sustainable environmental goals.

In Howlader and Ando (2020), "Consequences of Protected Areas for Forest Extraction, Time Use and Consumption: Evidence from Nepal," I study the importance of

protected areas (PAs) in rural livelihoods. Many forest PAs are in developing countries, where forests are a major source of food and fuel for households. Thus, biodiversity conservation may reduce the welfare of people in local communities. To explore this issue, I examine the effects of PAs in Nepal. From 1995-2003, the Nepalese government established several new PAs throughout the country. Using the Nepal Living Standard Survey rounds for 1995/1996 and 2003/2004, I evaluate the effects of these new PAs on household consumption and wood collection. The estimates suggest that the establishment of PAs has reduced the average forest-goods consumption by 30% to 70%, compared to the period before PA establishment, though this decrease has not translated into larger market participation in fuel purchases. The results vary based on how the PAs are managed. However, estimates regarding household welfare suggest neither significant negative effects from PA restrictions nor positive impacts on households from PA-based ecotourism.

Urban Land Policies and Housing Inequality. As a postdoctoral researcher at the Eviction Lab, I am responsible for designing projects and carrying out studies with my colleagues on the housing crisis and instability problem in America . We assemble and organize a database that covers information on tenant eviction for the entire United States. As a part of the lab work, I am leading several projects to understand the economic causes and consequences of eviction. First, I study variation in historical landownership inequality and landlord-tenant laws across states, and I assess how state- level variation can explain spatial variation in current eviction rates. Second, I am affiliated with a project studying primarily how rural and urban eviction rates differ and which socioeconomic variables explain the variations. Third, I also work on rental dynamics and eviction rates to study the spatial variations among cities. Fourth, we are exploring the effects of natural disasters and federal policies on the dynamics of eviction rates.

Site Selection Under Climate Uncertainty using Modern Portfolio Theory. I collaborated with ecologists and climate scientists for interdisciplinary projects. I have been working on a project entitled "Spatial Conservation and Investment Portfolios to Manage Climate-Related Risk," which employs the MPT from finance to see how it can be used to reduce climate uncertainty in conservation site selection (PI: Amy Ando). In a series of papers from this project, we are using MPT to understand its effects in selecting protected areas under climate uncertainty. In "How Much Can Portfolio Theory Reduce Climate Risk to Future Conservation Outcomes, and When Does It Work Best?," we apply a conservation portfolio method in 26 conservation problems to see where the MPT method works efficiently (Ando et al., 2018). In the two papers related to multiple objective site selection, we develop a simple but intuitively strong model and extend portfolio optimization theory to incorporate multiple objectives in site selection. The first paper is based on simulation models, where we try to understand all the possible types of correlation between species (Ando, Howlader, and Mallory, 2018).

Future Research Direction. In line with the specific projects described above, I will continue researching the institutional arrangements of historical and current land policies and their effects on diverse communities. My future research will continue to focus on understanding the effects of land conservation and housing policies in different contexts,

with the objective of identifying the social distributional consequences and the adjust mechanisms over time. My current projects recognize potential mechanisms relevant in the success of land policies. During the next decade, I intend to study the relationship between land-related policies and economic development to create interrelated policies in developed and developing landscapes. I hope that my work will inform policy design and contribute to understanding underlying economic processes, thereby responding to economic theory questions on land policies.

References

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