

Title: Social inequalities and institutional dynamics in natural resource governance

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The role of inequality has long been central to understanding collective action capacities and institutional design. Traditionally, institutional analysis and governance scholarships have examined inequalities through differences in individuals' endowments and assets. However, there remains a significant gap in understanding how ingrained social inequalities and de facto political power shape the emergence and evolution of governance. This study investigates the influence of these deep-rooted power dynamics on persistence of institutions and resource governance in common-pool resource settings. It examines how individuals' identities, linked to social categories such as caste and gender, along with their livelihood decisions and preferences for institutions, impact institutional change and resource governance. Through a computational model of small-scale irrigation systems, we analyze how individuals from diverse social groups collaborate, share knowledge, and make decisions regarding water allocation rules amid climate-induced water variability. Using empirical data from the Indian Human Development Survey to parameterize our model, we simulate collective choice scenarios, such as infrastructure repair, rulemaking, and water withdrawals, under various precipitation projections. Our results demonstrate how the preferences of farmers from advantaged social groups shape changes in water allocation rules and how shocks to water availability can exacerbate inequities by perpetuating rules that benefit elites. These results underscore the importance of de facto power in the institutional design and natural resource governance.