



Tropentag, September 17-19, 2014, Prague, Czech Republic

“Bridging the gap between increasing knowledge and decreasing resources”

Effects of Rules in Irrigation Systems: Evidence from Experiments in China, India and Vietnam

THANH LAN PHAM¹, ILONA OTTO², DIMITRIOS ZIKOS¹

¹*Humboldt-Universität zu Berlin, Dept. of Agricultural Economics, Germany*

²*Potsdam Institute for Climate Impact Research, Climate Impacts and Vulnerabilities, Germany*

Abstract

Irrigation systems are typically classified as common pool resources which often face the problems of under-investment and over-use. A solution to those collective action problems is to create and implement suitable rules. In China, India and Vietnam irrigation systems are strongly managed by governmental organisations with top-down policy and a largely objectively institutional design process. Moreover, irrigation governance is currently challenged by multi-pressures such as social, economic, environmental, and climatic that may require institutional changes. In this context, we question the possibility for irrigation users to craft their own rules and the influence of these self-crafted rules on irrigation governance. We employed laboratory and field experiments with farmers and students from China, India and Vietnam in order to compare behaviours of different decision-makers: students under laboratory conditions and farmers under field conditions across different socio-economic settings; 180 people participated in our experiments. Each experiment included three stages: no rule, externally imposed rules, and self-crafted rules by irrigation users. Each stage had 10 rounds. In total, we had 5400 observations of investment and extraction decisions. Four multilevel mixed-effect linear regression models were applied to investigate factors influencing investment and extraction behaviours of irrigation users. Our results show that physically asymmetric access to water resource created asymmetric distribution of investment and water extraction that favours upstream users. Compared to the situation of no rule, externally imposed rules were able to bring in more equal distribution of benefits among upstream-downstream users but were likely to reduce the volume of average investment and benefits. Self-crafted rules with strong enforcement worked the best in terms of giving more equal distribution among users and generating higher average benefits in comparison to situations of no rule and external imposed rules. Farmers tended to break the rules more frequently than students. Vietnamese players achieved the highest benefits. Individual characteristics of players including age and gender had only weak effects on players' behaviours. Our research confirmed two important policy conditions for equal and efficient distribution of resources that are the strong enforcement of rules and the participation of resource users in the process of designing rules.

Keywords: Asymmetric access, common-pool resource, self-crafted rules