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Understanding Climate Change Impacts on Common-Pool Resources Management: The Case of Collective Irrigation Systems in Argentina

Ana Alicia Dipierri[1], Dimitrios Zikos[2]

[1] *Hochschule für Technik und Wirtschaft Berlin - University of Applied Sciences in Berlin, Germany*
[2] *Humboldt-Universität zu Berlin, Albrecht Daniel Thaer-Institute of Agricultural and Horticultural Sciences (ADTI), Germany*

Abstract

Communal irrigations systems are composed of a natural common-pool resource, the water, which is distributed through a man-made common-pool resource, the irrigation infrastructure. Small-scale farmers are confronted with two decisions regarding the management of their communal irrigations systems: (i) how much to invest into the infrastructure maintenance and (ii) how much irrigation water to extract from the system. Moreover, environmental variations affect the timing and quantity of available irrigation water, increasing production uncertainties. Thus, small-scale farmers' dilemmas are aggravated since the uncertainty of water availability might disincentivize individual infrastructure contributions while exacerbating the likelihood of water over-extraction. This research aims at understanding how small-scale farmers manage their communal irrigations systems under environmental variations. An economic experiment originally developed for laboratory conditions was modified as a framed field experiment and was conducted to address this question. The empirical evidence from two communal irrigations systems in Northwest Argentina tested the eight hypotheses that the author proposed based on previous research findings and the pertinent literature. Some of the results were consistent with prevailing findings, while others challenged them. This thesis found that in the case under analysis and under environmental variations: investment converged; the communal irrigations systems capacity deteriorated; earnings increased; inequality decreased; cooperation improved and groups reporting low levels of institutional robustness exceeded expectations. Furthermore, this research uncovered potential strategies that could improve communal irrigations systems management under environmental variations in the area of study, while also contributing to the theoretical development of common-pool resources and communal irrigations systems in particular.

Keywords: Argentina, collective action, common-pool resource management, environmental variations, irrigation systems, Jujuy, small-scale farmers

Contact Address: Ana Alicia Dipierri, Hochschule für Technik und Wirtschaft Berlin - University of Applied Sciences in Berlin, Warthestrasse 64, 12051 Berlin, Germany, e-mail: dipierrialicia@gmail.com