

## Extended Abstract

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<b>Paper/Poster Title</b>	<b>Reciprocity and communal Governance: Evidence from Aymara Water Associations in the Bolivian Altiplano</b>
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**Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.**

<b>Abstract</b>	<b>200 words max</b>
<p>This study examines the relationship between trust, reciprocity, and the effectiveness of communal governance systems, specifically focusing on water associations managed by Aymara communities in the Bolivian Altiplano. We conducted experiments using path analysis and experimental economics to measure the levels of trust, reciprocity, and cooperative behavior among 100 indigenous Aymara community members. Our findings suggest that trust is a crucial factor in promoting cooperation, but positive reciprocity is equally essential in driving cooperation levels. However, we found that positive reciprocity was particularly low in the studied communities, while negative reciprocity was more prevalent. Our results demonstrate that the initial actions of trust were not reciprocated, which discouraged collaboration within the governance systems. While the communities displayed prosocial behavior, negative reciprocity challenged trust among community members, leading to the ineffective functioning of communal governance of water resources.</p>	
<b>Keywords</b>	Bolivia ; Communal Governance ; Reciprocity; Trust ; Water Governance
<b>JEL Code</b>	Field Experiments C93; Institutions: Design, Formation, Operations, and Impact D02; Behavioral Microeconomics D03; Analysis of Collective Decision-Making D7; Water Q25
<b>Introduction</b>	<b>100 – 250 words</b>
<p>Bolivia has a rich history of indigenous communities relying on communal land and water management practices. However, these practices have been disrupted by the expansion of extractive industries and neoliberal economic policies in recent decades, leading to conflicts over access to and control over natural resources, including water (Boelens et al., 2007, 2018, Dupuits, 2019; García et al., 2019; Helgrogen et al. 2021). Yet, internal challenges within the local governance bodies can also have a considerable impact and are, up until now, understudied (Fernández-Llamazares et al., 2016; Helgegren et al., 2020). In this study, we rely on the self-governance framework of Elinor Ostrom (Ostrom, 1990) to examine the behavior of indigenous Aymara community members in the Bolivian Altiplano, who manage different water associations.</p>	

Research showed that collaborative efforts rooted in conflict and resistance have been successful in bringing together small-scale water users in Bolivia to stand against external actors (Boelens et al., 2018). Yet, such solidarity may paradoxically lead to internal distrust and subsequent inefficiencies in collaboration (Dohmen et al., 2008). Whilst having a long and strong tradition of collective action, these communities are faced with inefficient management and conflicts within and between the associations. In this study, we demonstrate that trust alone is insufficient to promote cooperation in the communal governance systems. By focussing on the lack of positive reciprocity in societies with a strong history of collaboration based on negative reciprocity, we try to understand how such systems can function more efficiently.

**Methodology**

**100 – 250 words**

In July 2022, data was gathered from 100 randomly selected Aymara community members through economic experiments and surveys. As for the experiments, a standard dictator and trust game were conducted to assess altruism, trust, and positive reciprocity. In the main game, the trust game, an anonymous participant (Player1) sends part of an endowment (0%-100%) to another anonymous participant (Player2). The money send to this Player2 is tripled by the researchers. Upon tripling, Player2 can then decide what part of the tripled gift is sent back to Player1. In doing so, we arrive at a measure of trust, exhibited by Player1, and of positive reciprocity, exhibited by Player2. Participants were informed that they could potentially earn 0 to 360 Bolivianos (roughly \$0 to \$54) depending on the outcomes of the games.

A pre-survey before the games covered a broad range of socio-economic questions and included questions on trust in others and institutions and the value placed on cooperation, while a post-survey delved deeper into the participants' membership in and experience with the water associations.

To estimate the relevance and statistical strength of the relationships in the Ostrom Framework, Path Analysis was employed. Pathways between variables are positioned within a system of equations, in which the response variable in one equation can appear as an explanatory variable in another (Wright, 1934). The study aimed to capture the socio-economic determinants of trust, reciprocity and cooperative behavior, as well as the relations between these key variables.

**Results**

**100 – 250 words**

When examining the game results, remarkable low values of positive reciprocity were found, while the results on the trust-behavior of the Players1 in the trust game and on the behavior in the dictator games were more in line with other studies worldwide (Henrich, Boyd, Bowles, Camerer, Fehr, & Gintis, 2001; Henrich et al., 2010). Furthermore, our results revealed the relation between the amount send back by the Players2 and the money they received from the respective Players1 was non-existent. The influence of socio-economic factors on trust and reciprocity was limited.

The path analysis models confirmed challenges in positive reciprocity within the Aymara water associations to be the key hindrance for an efficient communal



governance system. Positive self-reported experiences with the water associations were significantly correlated with more trusting behavior in the game. Whilst higher trust showed positive correlation with self-reported value attached to cooperation, it did not correlate with higher observed positive reciprocity in the game. Positive reciprocity, which was remarkably low for the total sample, did not correlate with experienced benefits from the water associations.

**Discussion and Conclusion**

*100 – 250 words*

Our study contributes to understanding the challenges in sustaining cooperative systems and emphasizes the need for nuanced approaches beyond traditional trust-building efforts, as we highlight that trust alone may not suffice for effective communal governance. Positive reciprocity is essential, and serves an intermediate role as a conditional type of cooperation in the move from trusting others towards higher levels of sustained cooperation. Using the case of water associations managed by Aymara communities, we find this to be particularly relevant and difficult for societies with a strong tradition of negative reciprocal behavior. While the strong tradition of negative reciprocity is an important explanatory factor in the successful movement of collective action and resistance in these communities, it might also be key in understanding why collaborative systems such as the water associations are not functioning as they should.

Interventions should focus on intrinsic motivations for collaboration. Today, the focus in the Aymara communities often lies on organizing into cooperative relations with clearly defined rules and systems of control, expectations, and potential punishments, be it rooted in indigenous traditions or stemming from younger, more formal ways of organization. In other words, there is a strong tendency towards extrinsic motivations. This may be problematic as positive reciprocity in prosocial societies functions best if the underlying motivations are intrinsic; aimed at attaining social approval and building a positive reputation. However, we realize “promoting intrinsically motivated positive reciprocity” might be easier said than done.

## References

Boelens, R., R. Bustamanta, and H. de Vos. 2007. Legal Pluralism and the Politics of Inclusion: Recognition and Contestation of Local Water Rights in the Andes. In B. van Koppen, M. Giordano, and J. Butterworth (Eds.), *Community-based Water Law and Water Resource Management Reform in Developing Countries*. CABI.

Boelens, R., J. Vos, and T. Perreault. 2018. Introduction: The multiple challenges and layers of water justice struggles. In R. Boelens, T. Perreault, and J. Vos (Eds.), *Water Justice*. Cambridge University Press. <https://doi.org/10.1017/9781316831847.001>

Dupuits, E. 2019. Water community networks and the appropriation of neoliberal practices : social technology , depoliticization , and resistance. *Ecology and Society* 24(2): 20. <https://www.jstor.org/stable/26796946>

Fernández-Llamazares, Á., I. Díaz-Reviriego, M. Guèze, M. Cabeza, A. Pyhälä, and V. Reyes-García. 2016. Local perceptions as a guide for the sustainable management of natural resources: Empirical evidence from a small-scale society in Bolivian Amazonia. *Ecology and Society* 21(1): 2. <https://doi.org/10.5751/ES-08092-210102>

García, M. M., J. Hileman, and Ö Bodin. 2019. Collaboration and conflict in complex water governance systems across a development gradient: Addressing common challenges and solutions. *Ecology and Society* 24(3): 28. <https://doi.org/10.5751/ES-11133-240328>

Helgegren, I., J. McConville, G. Landaeta, and S Rauch. 2020. Importance of internal factors for community-managed water and wastewater systems in Cochabamba, Bolivia. *International Journal of Water Resources Development* 36(6): 1031–1053. <https://doi.org/10.1080/07900627.2019.1616536>

Helgegren, I., F. Minelli, J. McConville, G. Landaeta, and S. Rauch. 2021. Facilitating factors for community-managed wastewater systems in the Kanata metropolitan region, Bolivia. *Sustainable Cities and Society* 75. <https://doi.org/10.1016/j.scs.2021.103302>

Henrich, J., R. Boyd, S. Bowles, C. Camerer, E. Fehr, and H. Gintis. 2001. *Foundations of Human Sociality*. Oxford University Press.

Henrich, J., S. J. Heine, and A. Norenzayan. 2010. The weirdest people in the world? *Behavioral and Brain Sciences* 33(2–3): 61–135. <https://doi.org/10.1017/S0140525X0999152X>

Ostrom, E. 1990. *Governing the Commons*. Cambridge University Press.

Wright, S. 1934. The Method of Path Coefficients. *Institute of Mathematical Statistics* 5(3): 161–215.