



Creating resilient water governance for irrigated producers in Mendoza, Argentina



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ABSTRACT

This research explores the institutional water governance system of irrigated agricultural producers in Mendoza, Argentina in the context of a changing climate (predominantly increasing events of drought and water scarcity). An assessment is made of the impact of water governance instruments on producers using the methodology of vulnerability and adaptive capacity. Analysis focuses on the impact of the institutional water governance system on the adaptive capacity of producers' resources, or capitals (human, social, economic, technological, and natural). Conclusions and suggestions for improving the resiliency of agricultural producers and increasing the adaptive dimensions of Mendoza's water governance system are made based on this analysis.

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1. Introduction

1.1. Impacts of climate change

The community of Mendoza, Argentina (depicted in Fig. 1) is a desert oasis developed through intensive, artificially irrigated diversified agriculture (viticulture, horticulture and fruit production). It is a fragmented territory: 96% of the population and activities are in the irrigated area (4% of the provincial territory) situated in or near the capital city of Mendoza. A web of medium and small sized towns spread over agricultural lands away from Mendoza (Montana and Boninsegna, 2015). Scattered goat breeders (local Aboriginal communities descendants of huarpes) are 4% of the population and populate the other 96% of the lands that is non-irrigated desert.

The main water source is the glacier and snow melt fed Mendoza river. Extreme drought has been experienced in Mendoza in 2010–2014 (General Department of Irrigation (DGI), 2015) and 1966–1970 (Prieto et al., 2010). Long term climate change predictions are for an increase of between 2.5 and 3 °C and a reduction in snowfall and runoff of between 10 and 15%, but an

increase in summer precipitation of about 30% (ibid.; Boninsegna and Villalba, 2006a,b). The impacts of climate change are anticipated to be a water deficit increase and potential compromise of oasis survival (Montana and Boninsegna, 2015). There has been a cyclical decrease in water availability and an accentuation of extreme events such as hail, solar radiation, frost, exacerbating already typical problems of dry lands.

1.2. Concepts and theoretical framework

Institutions are an important determinant of the ability of a community to adapt to future climate change impacts and current climate variability (Willems and Baumert, 2003). Institutions can either advance the adaptation of the community and its members (constituting “institutional capital” see below) or hinder adaptation by preventing adaptive actions. The institutional governance system, or the pattern of dealing with basic social functions (Lauer et al., 2006), is an important component of the adaptive capacity and vulnerability (IPCC, 2001: 893–897) of agricultural producers (Hurlbert and Diaz, 2013), as are the resources or assets which agricultural producers have access to in order to build their livelihoods (Moser and Satterthwaite, 2008). Fig. 2 lists these resources based on what the IPCC calls “the determinants of adaptive capacity” (IPCC, 2001: 893). Access and control of these resources are important to reduce vulnerabilities, but it is the capabilities of actors to organize them into adaptive activities that

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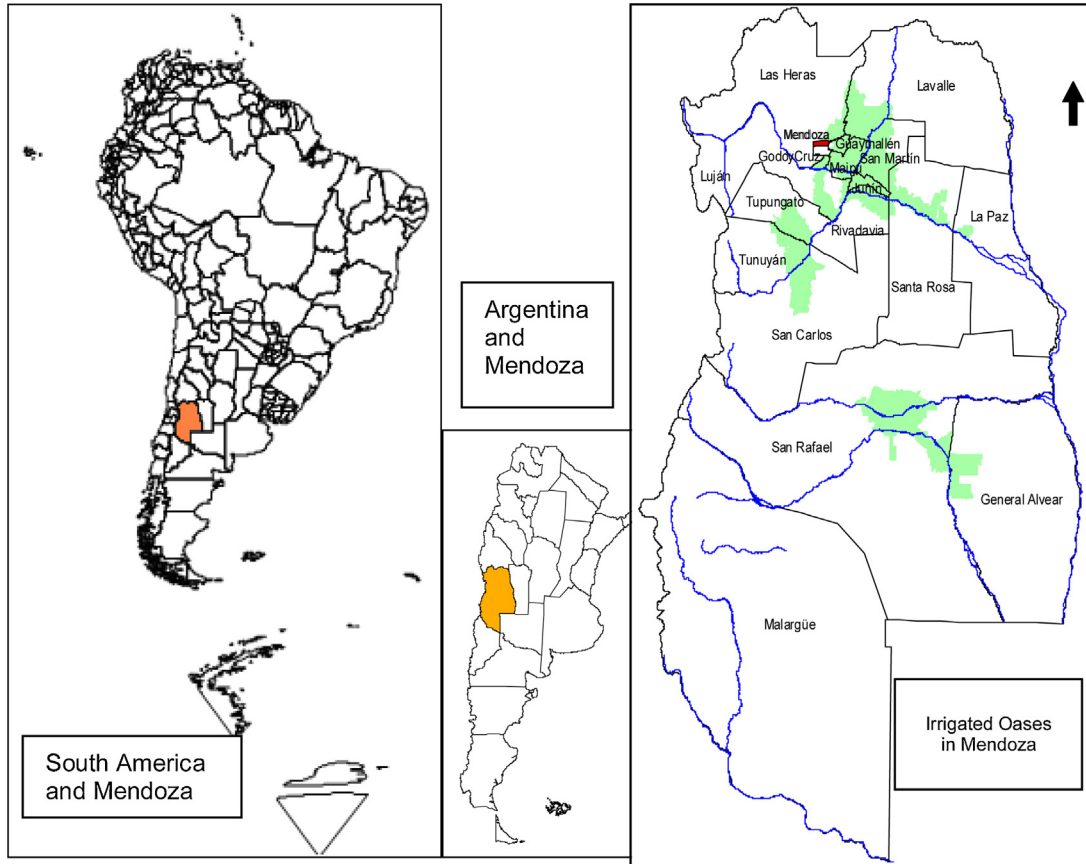


Fig. 1. Mendoza, Argentina.

defines the balance between sensitivity (determined by lack of or limited resources), and adaptation (defined by the existence of resources that could be mobilized to reduce sensitivity).

These determinants of adaptive capacity appear on Table 1.

Institutional capital exists within the context of governance and it is the researchers' hypothesis that adaptive governance facilitates institutional capital, which in turn facilitates other

capitals on Table 1. Governance, water governance, and adaptive governance will be defined in turn.

Governance encompasses laws, regulations, and organizations, as well as governmental policies and actions, domestic activities and networks of influence, including international market forces, the private sector and civil society (Demetropoulou et al., 2010: 341). It entails the interactions among structures, processes, rules,

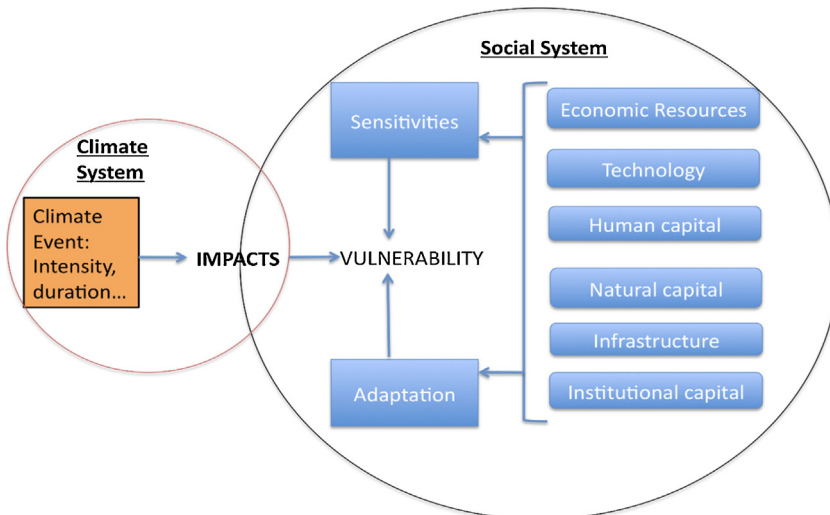


Fig. 2. The dimensions of vulnerability.

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