



## Opportunities and limits to ecosystem services governance in developing countries and indigenous territories: The case of water supply in Southern Chile



L. Nahuelhual<sup>a,b,\*</sup>, G. Saavedra<sup>c</sup>, F. Henríquez<sup>d,e</sup>, F. Benra<sup>f</sup>, X. Vergara<sup>b</sup>, C. Perugache<sup>g</sup>, F. Hasen<sup>h</sup>

<sup>a</sup> Instituto de Economía Agraria, Universidad Austral de Chile, Casilla 567, Valdivia, Chile

<sup>b</sup> Centro de Investigación en Dinámica de Ecosistemas Marinos de Altas Latitudes (IDEAL), Chile

<sup>c</sup> Instituto de Estudios Antropológicos, Universidad Austral de Chile, Chile

<sup>d</sup> Tercer Tribunal Ambiental de Valdivia, Chile

<sup>e</sup> MS in Community Development, University of California Davis and MS(c) in Economic Analysis, Universidad de Chile, Chile

<sup>f</sup> Helmholtz Center for Environmental Research – UFZ, Germany

<sup>g</sup> Magister en Desarrollo Rural, Escuela de Graduados Facultad de Filosofía y Humanidades, Universidad Austral de Chile, Chile

<sup>h</sup> Magister de Desarrollo a Escala Humana y Economía Ecológica, Escuela de Graduados Facultad de Ciencias Económicas y Administrativas, Universidad Austral de Chile, Chile

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### ABSTRACT

Limited evidence exists on the a priori feasibility of implementing ecosystem services (ES) governance arrangements, to simultaneously ensure nature conservation, human wellbeing, and equity. Using a multiscale institutional approach, we explore rules, property rights, and stakeholders' values and the extent to which such institutions may entail or prevent governance innovations around ES. We focus on water supply and a Southern municipality of Chile as an apt illustration. Results show that the concept of ES and ES mechanisms are exempt from formal norms (e.g., national laws). The formal institutional setting is generally weak with respect to nature conservation and a fragmented view prevails, where the management of land, water, forests and protected areas is separately handled by a myriad of agencies. The presence of highly concentrated water rights may impair benefits appropriability by ES beneficiaries, as long as any potential buyer can acquire water rights. Furthermore, incompatible values regarding nature create tensions across different stakeholders, particularly between hydroelectricity companies and indigenous communities. In this scenario of multiple rationalities, moving towards ES-based environmental governance seems problematic. In light of the evidence, it is clear that the ES approach does not necessarily fit in every local reality and seems to face obstacles, such as achieving equity and justice, particularly in contexts wherein local and indigenous knowledge systems have not been adequately considered by states within their institutional arrangements.

### 1. Introduction

Environmental policies relying on intrinsic value arguments have produced unsatisfactory outcomes in terms of jointly enhancing nature conservation, human wellbeing and equity (Chaudhary et al., 2018; Primmer et al., 2015). As a result, new policies worldwide have started to encompass the concept of ecosystem or environmental services (henceforth ES), which has led to a paradigm shift in the ethical and political grounds of environmental governance, from biocentrism to an emphasis on anthropocentric values (Gejzendorffer et al., 2017; Loft et al., 2015). In this new paradigm, environmental governance involves “the set of regulatory processes, mechanisms and organizations through

which political actors influence environmental actions and outcomes” (Lemos and Agrawal, 2006: 298) ES-based governance in turn, encompasses the formal and informal rules and values that configure how natural resources are used, how problems and opportunities are solved, what social behaviors are considered acceptable regarding ES transactions, and what incentives and sanctions are implemented to affect the pattern of ES use by a range of stakeholders (Muradian and Rival, 2012). The multiplicity of actors with various underlying value systems (ideas, ideologies, attitudes, values or beliefs) and interests shape individual use preferences and decision-making over ES (Brockhaus et al., 2014).

ES governance has recognized limitations regarding institutions,

\* Corresponding author at: Instituto de Economía Agraria, Universidad Austral de Chile, Casilla 567, Valdivia, Chile.  
E-mail address: [lauranahuel@uach.cl](mailto:lauranahuel@uach.cl) (L. Nahuelhual).

policy mixes and property rights, balancing actors' interests and values, and designing inclusive decision making processes (Beaumont et al., 2018; Loft et al., 2015; Saarikoski et al., 2018; Schröter et al., 2014). Yet, few evidence exists –beyond ex post evaluations of payment mechanisms – on how such limitations manifest on the ground. Most studies have focused on the outcomes of particular arrangements in defined spaces (e.g., Dougill et al., 2012; Kabisch, 2015) or on normative assessments (to some ideal or external conception), such as studies on protected area governance (e.g., Palomo et al., 2014). But few have addressed the feasibility of moving towards an ES-based governance (see for example Beaumont et al., 2018; Greenhalgh and Hart, 2015; Rode et al., 2015; Saarikoski et al., 2018), particularly in regions characterized by significant cultural differences, expressed as distinct worldviews.

Ignoring the ex-ante conditions that determine feasibility in such contexts may limit the comprehension of the factors influencing ES interventions, the range of practicable governance modes, as well as their efficiency, equity, and possibilities of progress (Bachev, 2016; Paavola and Adger, 2005).

Particularly in developing countries with contrasting worldviews, achieving new modes of environmental governance that ensure equitable outcomes, requires overcoming persistent barriers such as historical injustices, social inequalities, violence, and economic inefficiencies (Chaudhary et al., 2018; De Castro et al., 2016), which can make ES-based governance unattainable.

Building on the insights of New Institutional Economics, the purpose of this study is to explore structures and institutions that may entail or prevent governance innovations around ES, focusing on water supply as an apt illustration. The ecosystem services approach (ESA) to conservation (Beaumont et al., 2018) is meant to achieve two critical goals: (1) to help solve the tension between economic development and environmental conservation; and (2) to influence the decisions made by users of a resource base, so that they align their practices with the interests of ES beneficiaries (Primmer et al., 2015). This complexity ensures that the political economy of ecosystem conservation will encompass not just efficiency and effectiveness criteria, but also equity, justice and legitimacy criteria together with other ethical concerns (Paavola, 2005; Paavola and Adger, 2005; Sikor et al., 2014).

To better integrate ES in decision making, the New Institutional Economics perspective has emphasized the role and importance of institutions (Paavola, 2007), understood as collections of rights, rules and relationships that establish what can or cannot be done, and guide social practices and interactions among those who engage in them (Schlager and Ostrom, 1992). Institutions can be hierarchical (command-and-control coordination), non-hierarchical, building on consensus mechanisms (in market situations), trust (in cooperation or networks), and/or hybrid modes (Loft et al., 2015; Muradian and Rival, 2012).

This study focuses on three institutional dimensions that may facilitate or prevent ES governance innovations from emerging: i) the extent to which the concept of ES is included and operationalized through specific agreements in formal legislation and informal rules, from national to local levels; ii) the structure of existing property rights, since human benefits generated by ES are both private and public goods, associated with (or hindered by) a variety of property rights and other institutional arrangements; and iii) the meanings and values that different stakeholders place on ES.

In this context, we question the feasibility of new ES-based governance modes in developing countries, particularly in territories facing growing indigenous claims; a subject that has been scarcely addressed empirically and represents a challenge in ES implementation (see Chaudhary et al., 2018; Jackson and Palmer, 2015; Rode et al., 2015). Therefore, our research contributes to advance knowledge on this topic in light of serious findings affecting local, traditional or indigenous groups involved in environmental management following ESA.

## 2. Study context and research methodology

### 2.1. Case study

Governance studies usually require a multi-level and multi-actor analysis (Loft et al., 2015), including national to local scale inquiries. Chile, and its Southern territory in particular, provides a relevant context for environmental governance studies for at least two reasons. In the first place, Chile was the first Latin American country to engage with neoliberalism under the dictatorship regime (1973–90), which largely left environmental governance to the free market (Budds, 2013; Holmes, 2015). Likewise, municipality of Panguipulli in Chilean Patagonia, is representative of strong socio-environmental conflicts surrounding water claims in the whole country, where indigenous communities and hydroelectricity plants are the key confronting actors (Carruthers and Rodriguez, 2009).

Panguipulli, located in the Andes Range of Los Ríos region (region XIV of 16 administrative regions; 38°30' - 40°5'S and 71°35' - 72°35'W), is the largest municipality in the region, covering an area of 3292 km<sup>2</sup>, less than 0.5% of which is classified as urban land. It comprises 20.7% of the region's total native forest area. Population reaches 32,617 inhabitants, 30% belonging to the Mapuche ethnicity (INE et al., 2005). Although the remaining 70% declare themselves as Chileans not belonging to indigenous groups (INE et al., 2005), Mapuche ethnic influence is significant in this area given their particular cosmivision of the world and nature, as is the case with many other indigenous groups worldwide (Aguilar et al., 2010).

The municipality comprises about 6000 private properties ranging from 0.02 ha to more than 30,000 ha. Circa 5% of the municipality's area is protected by the Villarrica National Park and the Mocho Choshuenco National Reserve (16,968 ha), and 14.7% is protected by privately owned conservation areas (48,938 ha; Fig. 1).

### 2.2. Research design, data collection and analysis

The study is part of a 5-year project (2013–2018) aimed at mainstreaming ES in landscape planning, applying ESA. An ESA can take various forms and include numerous methods (Beaumont et al., 2018) as in the present case, but they have some common characteristics: i) the exploration of socioecological dynamics including the governance subsystem; ii) ES measurement and mapping; iii) ES integral valuation; iv) assessment of tools and strategies to mainstream ES.

Specifically, the study at hand involved the following steps. Firstly, we conducted a thorough revision of secondary sources of information to construct the formal and informal institutional context of Chile and the municipality regarding ES. Analysis of secondary information contemplated the reading of specific legal documents and national policies, regulations and agencies profiles, searching for the formal inclusion of ES, environmental service or ecological services, and to what extent documents and agencies specified ES implementation mechanisms.

Secondly, we applied in-depth, open-ended interviews to selected stakeholders, chosen from an actor map previously constructed. The interview covered the following aspects: i) social networks, including questions regarding date of creation and perceived effects on natural resources management, trust, and power relations; ii) presence and role of NGOs in the protection of natural resources, water and social rights, and NGO relations with local communities; iii) property rights including knowledge of the water markets, access to land and water over time, conflicts, and social relations across social actors regarding natural resources; iv) visions, definitions, and values on nature and human-nature relations and threats to natural resources; and v) participation in decision making regarding natural resources.

The interviews took place in 2015 and 2016 and were conducted by three of the authors. State representatives included one interviewee from each of the following regional and municipal offices: Regional Office of the National Commission for Indigenous Development

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