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"The commons" as a dynamic variable in understanding strategic alliances of scale: A groundwater case study in Pajaro Valley, California

Kirsten Rudestam [*,a], Ruth Langridge [b], Abigail Brown [a]

[a] University of California, Santa Cruz, College 8, 1156 High Street, Santa Cruz, CA 95064, USA
[b] University of California, Santa Cruz, Crown College, 1156 High Street, Santa Cruz, CA 95064, USA

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ABSTRACT

Groundwater, a critical resource in many parts of the world, is often characterized as a common pool resource (Brozovic et al., 2006). Multiple individuals utilize groundwater from a basin, and each person has the capacity to reduce the quantity or quality available to others. We turn to a case study of the Pajaro Groundwater Basin in Central California to re-envision the characterization of "commons." While providing a useful frame from which to analyze groundwater depletion in the Pajaro, we find Common Pool Resource (CPR) theory to be imprecise in its approach to a geographic scale. The notion of the "commons" is central to CPR studies, but there is wide divergence in what the "commons" constitutes, both spatially and socially (Laerhoven and Ostrom, 2007). Rather than propose a normative definition for the "commons," we suggest that the "commons" as a geographic category is socially constructed and dynamically active over time, akin to the analytic of scale as developed within the fields of political ecology and geography. This move from situating the "commons" as a fixed and discrete geographic area to that which is constantly changing and relational helps us to better understand the ways in which water users collaborate and communicate around shared groundwater sources.

1. Introduction

Groundwater is a critical resource in California, accounting for roughly a third of statewide water use during years of average precipitation. The volume of groundwater pumped generally exceeds both managed and natural recharge, especially during California's periodic droughts when pumping increases to compensate for reduced surface supplies (Famiglietti et al., 2011; Gleeson et al., 2010). This imbalance between groundwater pumping and aquifer replenishment contributes to basin overdraft, categorized by ongoing declines in groundwater levels in many areas of the state with concomitant negative impacts to both groundwater-reliant communities and the long-term ecological viability of the groundwater basin. These impacts include saltwater intrusion, subsidence, reduced surface water flows, water quality degradation, and permanent loss of storage. Predictions of global climate change, including higher temperatures and an increase in extreme events such as drought, will exacerbate groundwater declines and associated negative impacts (Famiglietti et al., 2011).

* *Corresponding author*. Tel.: +1 8315666803.
E-mail addresses: krudesta@ucsc.edu (K. Rudestam), rlangrid@ucsc.edu (R. Langridge), albrown@ucsc.edu (A. Brown).
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Groundwater rights are governed by a correlative doctrine that allows all landowners overlying a basin to pump as much as they want so long as use is reasonable and beneficial (Katz v. Walkinshaw, 1903). There is no state permit system for groundwater withdrawals in California. As such, groundwater can be characterized as a common pool resource where multiple individuals utilize groundwater from a basin, and each individual has the capacity to reduce the quantity or quality available to others (McGranahan, 1991). In the absence of informal social controls or external regulation, water users may have little incentive to consider the effects of their actions on the resource base or on other individuals. This can result in overuse and potential destruction of the resource (Hardin, 1968). Others counter this presupposition of resource depletion, and instead identify conditions that support sustainability of a common pool resource (Bakker, 2010; Ostrom, 2009).

We extend these divergent analyses to elaborate on the ''commons'' as a dynamic and socially-constructed concept utilized by water users and, as such, as an important factor in evaluating water use behaviors that can affect long-term viability of a common pool resource. While common-pool resource (CPR) theory applies to groundwater under California's legal system, CPR studies are not unilateral in their definition or demarcation of various ''commons'' (Laerhoven and Ostrom, 2007). We suggest that, rather than coming to agreement about this definition, we perceive the commons as a dynamic and relational category of inquiry. We illustrate this approach in our case study of the Pajaro River Valley (Pajaro) in Central California by pointing to different constellations of community (i.e. strategic alliances) that coalesce at different scales around groundwater in the Pajaro. This approach responds to other scholars who have called for a contribution of interdisciplinary analytic lenses to the realm of CPR (Geores, 1998; Gruby and Basurto, 2014; Lejano and Fernandez de Castro, 2014).

2. Theoretical perspectives on groundwater governance

2.1. *Common pool resource theory*

Studies in natural resource management illuminate the importance of individual and community interactions within physical and social environments and complex feedbacks between them through time and across spatial scales (Moran and Rau, 2014; Murphy, 2013). Perhaps the most widely regarded research in this realm is influenced by CPR theory. Defined by the Bloomington School in the early 1990s, and influenced by the research of Elinor Ostrom, CPR challenged the premise in environmental policy that resource users would inevitably destroy the shared resource without central government control or privatization (Araral, 2014). In contrast, CPR scholars empirically demonstrated that unregulated, shared resources do not invariably lead to degradation and depletion, but that resource use depends on a variety of other factors including social cohesion, geographic size, and informal rules (Agrawal, 2014; Berkes, 2004; Ostrom, 1999).

CPR scholar Agrawal (2014) describes Ostrom's work as being fundamentally interested in how and why individuals work toward common ends. Multi-disciplinary approaches, synthesized in Laerhoven and Ostrom (2007), illustrate cases wherein communities successfully manage common resources. This work paved the way for a growing database of empirical research, much of which outlines key variables central to understanding successful common resource management. These studies often counter the normative assumption that all individuals are selfish, norm-free, and maximizers of short-term results.

Ostrom (2010) turned to the concept of ''polycentrism'' to explain diverse institutional arrangements, such as private, for-profit, governmental, and community, as relevant for understanding complex motivational structures that are not easy to predict by simple economic models. In recognizing the importance of scale with respect to various institutional arrangements, Ostrom challenged assumptions around the geographical boundedness of the ''commons.'' But despite this theoretical headway, she and other CPR scholars have tended to delineate their research areas in concrete terms, by defining boundaries with respect to the location of human communities, or approximating the spatial geography of a resource base itself (Cox et al., 2010). Scholars have noted that the definitional ambiguity of ''the commons'' within CPR is problematic (Araral, 2014; Kerr, 2007). Geores (1998), for example, argued that work on CPR does not adequately define the resource; rather, it emphasizes the attributes of and management of the resource base. His work in the Black Hills National Forest demonstrates how different definitions of resource, or ''commons,'' emerged at different historical moments, and that these definitions changed as the community itself changed. Likewise, John Kerr (2007) notes that the proclivity toward managing at the watershed level exemplifies the difficulties of adhering to a bounded notion of ''the commons,'' arguing that watersheds can be ''micro'' or ''macro'' depending on the scale of analysis.

2.2. *Critical geography*

Gruby and Basurto observe ''an emerging foundation of interdisciplinary theoretical dialog regarding the relationships between physical geography, resource users, and institutional arrangements for CPR governance'' (2014: 49), but argue that there has been little engagement between CPR theorists and critical human geographers interested in scale. We respond to this call for theoretical complementarity in expanding on the social construction of scale, by turning to the fields of critical geography and political ecology (considered, for this paper, as a subset of critical geography), where the issue of scale has long been a subject of debate. In these studies, rather than solving the definitional problem of scale, scholars understand scale to be a process, which allows for greater methodological clarity (Robbins, 2000; Marston, 2000; Neumann, 1992; Swyngedouw, 2004).

A key theme in political ecology investigates how ecological practices are political acts. Scale plays a key role in the politicizing of natural resource management practices. As Cohen and Bakker argue, ''particular ecological configurations can be simultaneously depoliticized and repoliticized through