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Precondition for Integration: In Support of Stand-alone Social Science in Rangeland and Silvopastoral Research^{☆,☆☆}

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ABSTRACT

Most agree that social and ecological approaches should be integrated to ensure sustainable management of natural resources. However, an analysis of the content of three problem-based journals shows that if social sciences are included at all, they are typically subservient to natural sciences, and that quantitative approaches are privileged. We argue that true integration is achievable only if natural sciences and social sciences are each robust and if they meet eye to eye. We call for more openness to stand-alone social science research in problem-based journals, especially to research using qualitative methods. We highlight the potential insights derived from studying decision makers at the microlevel: the pastoralists, farmers, ranchers, and foresters who make final management choices. We argue that publishing such qualitative social sciences promotes dialogue across disciplines, strengthens integration, and increases the real-world impact of research.

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Integration needs healthy disciplines.

“The plural of anecdote is not data”

(variously attributed to natural scientists George Stigler, Frank Kotsonis, and Roger Brinner)

“The plural of anecdote is data”

(attributed to political scientist Ray Wolfinger; italics ours)

The two contrasting quotations (above) illustrate a broader issue in integrative research (i.e., research that integrates several academic disciplines, or academic and nonacademic participants) (Tress et al. 2005). The meaning of the first quotation is clear to natural scientists: a few anecdotal cases are not on par with findings derived from a well-replicated research study. The meaning of the second is clear to

social scientists: anecdotes accumulate to comprise data, if they span the full range of a given experience. The quotations illustrate how the two broad academic domains that are often recruited in integrative research—natural sciences and social sciences—differ in how they assess the validity of data and reliability of evidence (Moon et al., 2016). Though integration is often called for, epistemological differences still make it a challenging endeavor.

This special issue is dedicated to highlighting the need for—and value of—integrated social-ecological approaches, arguing that integrative research is needed to fully tackle challenges in rangeland and silvopastoral systems, where social systems are interconnected with production ecosystems (Briske et al., 2011; Brunson et al., 2016). Such systems are shaped by—and shape—local cultural heritage and traditions, so to improve their management, we need to understand both their human and their biophysical dimensions. Social sciences capture the human dimension: macro-level studies analyze how the social, cultural, economic, and political context influences management choices, and micro-level studies analyze how individual or group values impact behaviors (Norton, 2016). If a goal of integrative work in applied rangeland and silvopastoral research is better management of the associated systems, we need social sciences to give voice to land management practitioners: farmers, ranchers, foresters, and pastoralists. Yet much of the work in natural resource management focuses solely on the biophysical dimension (Robinson et al., 2012). The resulting recommendations are often not implemented because they ignore well-established social science insights.

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☆☆ Integrated Social-Ecological Approaches to Silvopastoralism (Huntsinger and Plieninger, editors)

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This special issue demonstrates that rich, integrated social-ecological research is already happening. Our intent is not to question the value or quality of such integrative work. Rather, we reflect on how to balance it with stand-alone social science research. Integrative research should build on mutual appreciation and regard between social and natural sciences. Integration will be weakened if the two academic domains do not meet on equal terms and bring equivalent maturity. To enable this, social science should be given space to develop, ideally published side by side with natural science. What we see instead is social science being invited to participate but not encouraged to stand alone. Journal editors who favor natural science submissions over social science contributions weaken integration in the long term.

This forum paper outlines evidence of a growing bias against stand-alone social science in the context of rangelands and silvopastoral systems and illustrates how such bias limits the practical relevance and impact of research. It concludes by describing potential benefits of publishing stand-alone social science research alongside natural science papers.

Evidence for Bias Against (Qualitative) Social Sciences

Discipline-specific journals (e.g., *American Journal of Sociology*) focus on a particular branch of knowledge, publishing papers covering various areas of application. In contrast, problem-based journals (e.g., *Rangeland Journal*) focus on a specific land use system or a specific issue, enabling researchers from a variety of disciplinary backgrounds to exchange insights. In theory, such journals should support all the individual disciplines necessary to tackle the issue, as well as welcoming integrative scholarship. While many problem-based journals include terms such as “socio-economics” in their aims and scope, there is evidence that some are increasingly hesitant, if not openly against, publishing stand-alone social science.

To illustrate—but without pretension to be exhaustive—we looked at recent volumes of three rangeland and agriculture journals to assess the distribution of papers between natural sciences and social sciences, particularly qualitative social sciences. Of the 61 papers published in *Rangeland Ecology & Management* in 2016, there was only one social science paper (Wilmer and Fernández-Giménez, 2016). This paper was in press before the new editorial regime, which explicitly emphasizes the biophysical domain (Sheley et al., 2016). In comparison, of the 77 papers published in *Rangeland Ecology & Management* in 2011, five were social science papers (four of them qualitative). *Agricultural Systems* effectively closed its door to papers based solely on qualitative social science research in the early 2010s. The current aims and scope require papers to have “substantive natural science content (especially farm- or landscape-level biology or ecology, sometimes combined with social sciences).” As a result, of the 121 papers published in 2016 in *Agricultural Systems*, 34 papers include social sciences, but only 1 of them was qualitative (Dolinska and d’Aquino, 2016). In its aims and scope, *Agriculture, Ecosystems and Environment* encourages papers that integrate knowledge, yet it explicitly discourages “studies that are purely ... socio-economic, or political.” As a result, of the 519 papers it published in 2016, only 2 involved land manager interviews or surveys, and both used quantitative methods to analyze them (Marshall et al., 2016; Nath et al., 2016). This assessment covers only a small sample, but the implications are unequivocal and may indicate a broader pattern.

A number of problem-based journals are effectively closing their pages to stand-alone social science articles, especially if the research uses qualitative methods. This could be linked to journal editors succumbing to the throes of impact factor mania (Casadevall and Fang, 2014). Indeed, natural science publications tend to be more highly cited than social science publications (Nederhof, 2006), so publishing the former is more likely to increase a journal’s impact factor (Alberts, 2013; De Silva and Vance, 2017).

A more general challenge is maintaining the editorial goals of a problem-based journal given attrition at the edges of any field (Campbell, 1969). The apparent bias in the selection of manuscripts may feed a vicious circle, as big fields get bigger and smaller ones

atrophy. Indeed, we hear often of scholars who were discouraged from social sciences in their early careers because it reduced their opportunities to publish in top-rated problem-based journals. The imbalance between natural science and social science content in the three sampled journals is certainly dramatic. Feminist scholars have noted the same in the study of climate change, suggesting politics extend well into the academic realm, shaping whose voices are heard and privileging the so-called objective sciences (MacGregor, 2009; Eriksen et al., 2015). The gender and race aspects of this phenomenon are hard to ignore, given typical demographic differences in the numbers of Ph.D.s awarded across the natural and social sciences (Leslie et al., 2015).

Dark Side of the Passion for Integration

That problem-based journals support integrative work is welcome. However, making integration a precondition for publishing presents a dark side: It subordinates social science to natural science, shifting it to a weaker—and perhaps even servile—role (Donovan, 2005). If social science is relegated to such a subservient role, it could erode its foundations in at least three ways.

First, requiring integration for publication may put natural science in control of the social science elements in a research project (i.e., who does it and what is done). Anecdotally, it is quite common for natural scientists leading integrative research projects to ask a junior colleague with a similar natural science background to take on the social aspects. This is likely to limit the scope of social sciences work within the integrative project, as the questions, theories, and methods will be those with which natural scientists are most familiar and comfortable (e.g., high-*n* quantitative approaches, cultural ecosystem services, post-hoc workshops for stakeholder outreach).

Second, restricting social science to publication only in conjunction with natural science results may suppress social research outcomes that diverge from biophysical results. Indeed, social science results will likely only be seen as “relevant” if they agree, support, or complement biophysical findings. But if they do not? What if natural scientists identify one management practice as most effective but social science methods find that ranchers or pastoralists rate another practice as more effective? Privileging natural sciences results will inevitably lessen the likelihood of understanding and resolving the discrepancies, making it less likely that management practices on the ground will improve.

Third, limiting the publication of stand-alone social science papers in problem-based journals will make them harder to find. A diffuse distribution makes it more difficult to stay abreast of and build upon work on a specific issue or to develop robust methodological expectations (Abbott, 2001; Moon et al., 2016). Social and natural scientists will be exposed less often to one another’s ideas and norms. This may reinforce the polarization between natural sciences and social sciences (Sherren and Kent in press), as researchers have little opportunity or incentive to appreciate each other’s contributions.

Illustrating the Contribution of Qualitative Social Science

In many rangeland or silvopastoral systems, the farm scale is equivalent to the farmer scale. In others, livestock and land management is practiced on public lands, leased, or held in common. Sometimes land is used nomadically. Yet in all rangelands and silvopastoral systems, the micro-scale is critical to understand the management of natural resources: the decisions of land managers influence and are influenced by landscape characteristics, ecosystem dynamics, cultural heritage, institutional environments, and commodity markets. Research on land managers can be used to understand management trade-offs in specific operating environments or to highlight the idiosyncratic values and preferences that influence decision making. We have much to learn through engagement with land managers.

One opportunity for improving land management is to recruit the land manager as a trusted expert, collaborator, and knowledge co-

creator. Some in the natural sciences discredit land managers as unreliable (Briske et al., 2014). We argue that it is hubris to discard the knowledge of those who have been working and sometimes living with a specific ecosystem for many years, often decades (Blanc, 2009; Fernández-Giménez and Fillat Estaque, 2012). They and their families will bear direct consequences from any management errors. Moreover, engaging with land managers will highlight the diversity in their constraints and objectives, allowing researchers to tailor options to achieve sustainable land stewardship. By working with land managers, qualitative social sciences can help illuminate why scientists and practitioners often have different perceptions of what “works” (Sayre, 2004).

Recognition of land managers as experts would mirror advances in the field of fisheries, which today has a distinct research subfield around fisher knowledge (Hind, 2014; Stephenson et al., 2016). Like land managers, fishers are not all the same. This has only recently been accepted by those studying fisheries. During the 1980s and 1990s there was a debate about whether the person at the helm of a fishing boat had any impact on the catch. Some believed only the fishing effort (i.e., time and amount of nets/hooks), technology, or environment mattered. Others argued that, independent of those variables, there is a so-called “skipper effect” (Bjarnason and Thorlindsson, 1993; King, 2011). The skipper effect is now well accepted. It originated in qualitative social science research that was controversial at the time, supported only later by quantitative studies (Marchal et al., 2006; Vázquez-Rowe and Tyedmers, 2013). The diversity of early results has been linked to social context, physical setting, a lack of shared language (Pálsson and Durrenberger, 1990), and the application of natural sciences norms to social sciences (Gatewood, 1984). This “evidence journey” (sensu Nutley et al., 2013) may hold some lessons for the trajectory of esteem for land manager expertise in silvopastoral and rangelands research. Several researchers are leading the way with strong foundational pieces on the knowledge of ranchers and silvopastoralists (Knapp and Fernandez-Gimenez, 2008; Knapp and Fernandez-Gimenez, 2009; Fernández-Giménez and Fillat Estaque, 2012; Girard, 2015; Meuret and Provenza, 2015).

Without robust, stand-alone social science to build upon, fundamental aspects driving the choices of land managers can be missed. For instance, natural science approaches (and some in quantitative social science) tend to assume that land managers strive primarily for technical effectiveness or economic efficiency (Sayre, 2004). Yet qualitative social science has shown that land managers are “value rational,” which means their decisions are guided by the meaning they attach to their actions (McIntosh et al., 1990). Moreover, land managers have a much wider diversity of objectives than is typically taken into account in modeling work, including objectives such as legacy, lifestyle, and independence (Ahnström et al., 2009).

Recommendations derived from natural science research are rarely tested across this range of objectives (Jakoby et al., 2014). This disregard for the values and objectives underlying practitioner decision making can fuel resistance to research outcomes. Social scientists may then be asked to study how land managers can be “motivated” to adopt the recommendations, preferably using quantitative surveys (Pannell et al., 2006). This post-hoc approach is problematic. First, rather than questioning the assumptions underlying the models, it frames the practitioners as the problem to be solved: How can they be “incentivized” to implement the practices that they “should” be implementing? Second, it assumes that land managers suffer from a deficit of knowledge and thereby reinforces the linear model of knowledge transfer with its implicit hierarchy between science and practice (Liu et al., 2014).

Land managers have expert knowledge of the complexities and dynamics of their very specific social context and natural environment (Fazey et al., 2006). This knowledge is devalued when recommendations and governance systems build on a “command and control” approach (sensu Holling and Meffe, 1996). In many cases, it would be more effective to design result-based rather than practice-based schemes. These empower land managers to select practices appropriate

to their specific context to achieve the desired environmental outcome (Darnhofer et al. in review; de Sainte Marie, 2014; Santo et al., 2015). Land managers can help us understand the cumulative impacts of the many policy instruments that form their operating environment (Beilin et al., 2012).

Like any experts, including researchers, land managers do not like to be patronized or meddled with. Just as researchers prize their academic freedom (Dill, 1982), land managers prize their independence when experimenting, as well as their autonomy when making choices (Stock and Forney, 2014). A respectful approach is to partner with social scientists early on in the research process, not least to facilitate the effective involvement of land managers as knowledge co-creators. This would acknowledge and strengthen the active role of managers in farm- and landscape-scale management strategies (Hart et al., 2016) and avoid shifting their decision making from intrinsic to extrinsic motivations through incentives (Pinto-Correia and Azeda, 2017).

Valuing Social Science Is Fundamental to Integration

This journal and this special issue seek to identify sustainable grazing practices for diverse geographies, conditions, economies, and societies. Integration of natural science and social science will go a long way toward meeting this aim. But this integration relies, in part, on robust disciplines. To strengthen social science contributions to sustainable rangeland and silvopastoral systems, problem-based journals should strive to be a hospitable environment for stand-alone social science research, with appropriate editorial oversight and reviewer selection. Absent that, qualitative social science is particularly at risk, despite the important contributions it can make. But equally at risk are the knowledge and resource improvements that land managers may gain from working with social scientists, building a better social-ecological system and—no less—an improved human capital and community.

Welcoming robust manuscripts based solely on qualitative research will improve mutual understanding and respect across disciplinary boundaries, model a range of academic paths, and help consolidate knowledge. Quantitative methods and natural sciences must not be the final arbiter of what “works,” as they tend to neglect insights that are critical to achieving impact in the real world.

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