



Does local monitoring empower fracking host communities? A case study from the gas fields of Wyoming



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ABSTRACT

High Volume Hydraulic Fracking (HVHF) will continue to expand as a key influence on rural land-use patterns and community well-being over the next several decades, creating a real need to empower host communities to navigate a clear course among positive and negative social and economic impacts. This paper evaluates an experimental approach to monitoring and mitigating social and economic impacts of HVHF development in Wyoming, USA between 2005 and 2009. The goal of the analysis is to assess how HVHF development in a rural setting creates unique opportunities and challenges for community-based and participatory planning and impact assessment approaches. Using archival data, oral history transcripts, and interviews, we conclude that a community-based approach can be effective as a response to HVHF development, provided there is adequate scaffolding in the form of technical and financial assistance and supporting metagovernance. We also observe that the intensity of HVHF development creates special problems that surface as strained relationships and limited capacity among key stakeholders such as local government officials, their staff, and their constituents. Well-supported community-based and participatory processes to social and economic impact assessment that encourage social learning, inclusive deliberation with transparency, and accountability can mitigate these problems, but require extensive political and administrative support to do so.

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1. Introduction

Unconventional oil and gas development is expanding rapidly in the United States, transforming rural landscapes at a rapid pace (Allred et al., 2015). Although development activities associated with high-volume hydraulic fracturing (HVHF) often create dramatic surges in local economic activity (Weber, 2014), long-term prosperity from oil and gas development is not a given. The literature that assesses long-term economic and social impacts from oil and gas development is sparse, but existing studies give reasons for communities to expect that economic and social risk accompanies HVHF development (Freudenburg, 1992; Guilford, 2003; Haggerty et al., 2014; Headwaters Economics, 2008; Jacobsen and Parker, 2014; Jacquet, 2014; James and Aadland, 2011; Papyrakis and Gerlagh, 2007). The limited size of the workforce, lack of services and infrastructure to accommodate industrial activity and rapid immigration, and limited preexisting economic diversification all

increase the possibility of negative consequences for rural places undergoing new (or renewed) oil and gas drilling. In addition, oil and gas development continues to be associated with volatile commodity prices and the corresponding “flickering” effects on local employment and revenue (Haggerty and Haggerty, 2015). Leaders and residents of rural communities experiencing HVHF development often understand, and hope to avoid, the risk that HVHF-driven booms will deplete, rather than enrich, community capital in the long run, although exactly how to do this remains an elusive question.¹

Given the uncertainties about the long-term outcomes of HVHF for local communities, assessing, monitoring, and mitigating local impacts of HVHF over the course of development have particular

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¹ Despite the expansion of HVHF in metropolitan and suburban areas, oil and gas extraction continues to be overrepresented, both geographically and economically, in rural areas (Jacquet and Kay, 2014). The pace and scale of development is extensive. From 1998 to 2011, private employment in oil and gas extraction grew by 66 percent to more than 330,000 jobs in the United States. As a share of private employment, oil and gas extraction is four times more important in nonmetropolitan than in metropolitan U.S. counties (Ratner and Tiemann, 2015).

importance. Monitoring data and related analysis can potentially inform both resource development and local planning efforts. Yet despite its potential value, there are few local, state, or federal mandates to monitor or mitigate social and economic impacts from HVHF development in the United States. Federal agencies and some states mandate predevelopment impact assessments as a condition of permitting wells, but ongoing monitoring and mitigation of social and economic impacts is rare or nonexistent. As a result, monitoring and assessment of social and economic impacts of HVHF development occur on an ad hoc basis, or not at all.

This is in contrast to, but not completely disconnected from, developments in other international contexts. Regional regulation of Australia's coal-seam gas development mandates an impact assessment and monitoring process that extends beyond the predevelopment phase. These efforts, led by academics and supported by industry, have ample expertise and funding. Still, in practice, even this model approach in Australia could be considered ad hoc in that the mandate is restricted to the region and, because few models or templates exist, the impact assessment team has developed a process *de novo* (Rifkin et al., 2015). Planning around coal-seam development Australia is not without critics (Mercer et al., 2014; Morrison et al., 2012).

This paper is an effort to address a gap in scholarship that stems from the inconsistent practice of social and economic impact monitoring and mitigation in relation to HVHF. The published academic literature has little to say about whether, why, and how efforts to monitor social and economic outcomes of HVHF development have been or are being conducted, whether these efforts are effective in helping align HVHF development processes with community development goals, and what outcomes monitoring and mitigation efforts might yield for communities. Background research conducted for this work revealed that impact assessment beyond the project approval stage is infrequent and/or unsystematic. When it occurs, impact assessment and mitigation often involve local actors focused on local-scale impacts.

This paper specifically focuses on the usefulness of community-based and participatory approaches to socioeconomic impact monitoring and mitigation related to HVHF development. The rationale for this focus is twofold. On the one hand, the pros and cons of conducting social and economic impact analysis at a local scale using local citizens merits attention for purely practical reasons: these are the *de facto* options in a policy environment that does not require states or industry to conduct formal monitoring or mitigation. On the other hand, community-based and participatory approaches merit evaluation because of their interest to scholars. There are substantial bodies of scholarship focused on the legitimacy and rationale for “bottom-up” approaches to development and planning broadly defined, yet little evaluation of the role of such strategies in HVHF development.

At the broadest level, this paper asks this question: in which ways are community-based and participatory approaches effective or ineffective as strategies for monitoring and mitigating socioeconomic impacts of energy development? What is the role of key situational and contextual factors on impact assessment, monitoring, and mitigation processes? More specifically, how does HVHF development influence the basic criteria for effective participatory processes? Our inquiry is based on a case study of an effort to monitor and mitigate social and economic impacts of a 2000–2008 rush of HVHF-based natural gas development in rural Sublette County, Wyoming, U.S.A. The Sublette County process involved many best practices in impact assessment and environmental management: a participatory approach to monitoring as well as an adaptive management framework. Based on these qualities, the process and its evolution offer rare and important insights into an issue of relevance to many rural communities anticipating or

experiencing new HVHF development.

The paper is organized in the following way: Section 2 establishes a conceptual framework and policy context for the analysis. Section 3 explains the background and methods for the case study. Sections 4 and 5 develop and analyze the case study according to its two major chronological phases. The paper concludes with a brief summary and thoughts about future research directions.

2. HVHF impacts: community-based approaches to assessment and mitigation

Planning for and management of HVHF development are critical because this intensive form of industrial activity creates a predictable set of issues for rural areas. These include economic risks of diminished long-term economic performance related to boom-bust cycles driven by commodity price volatility and reflected in dramatic postboom episodes of outmigration, poverty, unemployment, and property devaluation (Haggerty et al., 2014; Jacquet, 2014). Rural areas are also prone to social disruption when rapid industrialization and population growth intersect with limited local capacity and uneven distribution of costs to produce high stress, community conflict, and inefficiencies in the development process (Freudenburg, 1992; Fuller, 2007; Gramling and Brabant, 1986; Guilford, 2003; Jacobsen and Parker, 2014; Wilkinson et al., 1982). While it is important to tailor the social disruption model to the new financial, spatial, and temporal dimensions of HVHF-led development as Jacquet and Kay have recently suggested (2014), it is not clear that there are fewer risks in rural areas. There is little anecdotal or published research contradicting the idea that HVHF energy development involves major social disruption and boom-bust episodes of growth and change in rural areas.

In sum, the literature gives good reasons for rural places experiencing HVHF to utilize planning and assessment to prepare for and respond to a number of potential social and economic impacts. Correspondingly, planning, impact assessment, and governance practices and concepts are all vital to HVHF communities; for example, governance structures strongly influence if and how planning and impact assessment occurs as well as the range of possible responses to findings about impacts. Adaptive management has been identified as a governance strategy appropriate to HVHF development situations (Konschnik and Boling, 2014). Adaptive management encourages effective impact assessment and mitigation by design because it involves a dynamic process of collecting information about outcomes of management choices and adjusting decisions and operations based on analysis of that collected information (Williams, 2011). Its applicability to HVHF stems from the options to adjust the pace and scale of drilling (or other aspects of development) based on changing information and/or unanticipated impacts, which is especially salient given scientific uncertainty about immediate, as well as cumulative, HVHF impacts (Konschnik and Boling, 2014). Monitoring constitutes an integral and fundamental element of adaptive management.

At the same time, social impact assessment best practice stresses the importance of sustaining assessment (monitoring) and mitigation across project phases (Esteves et al., 2012; Vanclay, 2006). Yet, the failure of most impact assessment processes to achieve sustained monitoring beyond the initial proposal phase is a well-documented and systemic problem (Burdge, 2002; Esteves et al., 2012). Therefore, in principle, adaptive management provides a platform that can address cumulative impacts and uncertainties endemic to a new, intense technology like HVHF while also overcoming barriers to sustaining social and economic impact assessment (Canter et al., 2011).

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