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There's no real choice but to sign: neoliberalization and normalization of hydraulic fracturing on Pennsylvania farmland

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Abstract Finewood and Stroup (J Contemp Water Res Educ 147(1), 72–79, 2012) observe that as hydraulic fracturing for natural gas spreads across the USA, neoliberal ideologies normalize fracking's potential dangers, including impacts to water and more general environmental quality. Theoretical observations like these must be tested empirically. I do so here, analyzing data from extensive fieldwork in Pennsylvania's Bradford, Susquehanna, and Washington counties. Drawing on comparative mixed method data from fieldwork in northeastern Pennsylvania's 'Endless Mountains' region and the Pittsburgh area, I compare how small-scale farmers perceive and sometimes enact elements of market-based, neoliberal rationality when assessing hydrofracking's community, environmental, and economic outcomes. This paper explores why this matters sociologically, given small-scale farmers' roles as land-use decision-makers, stewards of related natural resource development, and marginalized producers with limited access to market shares and subsidies. In counties like Bradford and Washington, impacts of fracking small-scale farmers have been under-studied. To address that gap, I examine impacts on farmers operating around natural gas development and within neoliberal economic structures. Analyzing extensive interview and ethnographic data, the following research questions are addressed: (1) Among small-scale farmers impacted by hydraulic fracturing, what evidence exists that neoliberal logic helps farmers normalize fracking? and (2) How does normalization interact with decisions to sign natural gas leases? My findings indicate that many farmers utilize neoliberal logic when assessing impacts of hydraulic fracturing and shale gas development, particularly as rapid energy development relates to their land-use decisions. Neoliberal normalization of hydraulic fracturing emerges most saliently regarding environmental outcomes and economic development. I connect this to small-scale farmers' economic vulnerability and the limited agency in dictating land use near their farms.

Keywords Hydraulic fracturing · Fracking · Natural gas development · Neoliberalization · Neoliberalism · Agriculture · Energy development

Introduction

Natural gas has provided energy for decades. Yet, its production in the USA has grown by 20 % in the last 5 years, fueled by recent technological advancements like horizontal drilling and increased use of hydraulic fracturing in shale formations. In the last decade, the number of producing natural gas wells increased by 146,000 (Energy Information Administration (EIA) 2012). Exxon Mobil, BP, and Chevron now invest heavily in shale gas production, helping create one of the largest energy production surges in US history (Soeder 2010). Nearly 20 states host production operations and others prepare for the industry. Even with hydraulic fracturing's contested use, development spreads rapidly across the USA and may be increasingly seen as the 'new normal' by people living above natural gas deposits.

To 'frack'[1] a natural gas well, a temporary rig drills thousands of feet until reaching the water table. Cement is

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[1] I use the term 'frack' here because of its common use in public and media discourse. The term 'fracking' has many connotations, some of them politically controversial. The industry rejects the term, seeing it as a slur used deliberately by the environmental movement—even misspelled, some say—to evoke more vulgar terms that convey opponents' strong stances against the drilling process.

poured in to seal the well, and vertical drilling then continues to the shale layer found about 3,000 to 8,000 feet below the surface. Horizontal drilling commences, driving new wells at 90° angles several thousand feet through shale. Perforations are made by small explosions in the pipe, loosening natural gas tucked in the shale. Millions of gallons of water, sand, and chemicals are then pressurized down the well, widening shale fractures. Pressure naturally forces flowback water back up the well's piping, where it reaches the surface and is then re-injected into wells or stored in evaporation ponds. Natural gas moves from shale fractures up the well's piping, with the initial flow of gas burned off and subsequent batches captured and stored for sale. Supporters see natural gas as a 'bridge fuel' to transition electricity production from coal to renewable sources like solar power. They assert such development should proceed quickly to reduce coal consumption, meet energy demand vital to US economic power, and provide US-based jobs (Howarth et al. 2011). Opponents argue we must be more cautious about environmental, economic, and human health implications (Colborn et al. 2011; Osborn et al. 2011). As hydraulic fracturing (hereafter 'fracking') increases in the USA, inevitable interactions with communities and ecological systems unfold in widely divergent geographical contexts that add complexity and unpredictability to the technology's implementation. Communities and ecosystems interact with fracking in neoliberalized contexts, as neoliberal capitalism "drives the politics, economics, and culture of the world system, providing the context and direction for how humans affect and interact with non-human nature and with one another" (Heynen and Robbins 2005, 5). As fracking spreads, people may employ neoliberal ideologies to help normalize it, analyzing risks using largely individual-level cost–benefit frameworks. Cost–benefit narratives help residents utilize market-based, or neoliberal, logic to balance risks of water and air pollution, for example, against benefits of economic development (Finewood and Stroup (F&S), 2012), with neoliberal development "presented as an inevitable and natural state" (Heynen and Robbins 2005, 6). Neoliberal logic can make markets that are privileged above people, environmental degradation, and persistent poverty *seem* normal, at least acceptable. Neoliberal logic's role in shaping responses to fracking is the focus of this piece.

In Pennsylvania, natural gas development has grown exponentially in the last half decade, speeding ahead even as regulations and enforcement lag behind. The Marcellus Shale stratum is found under Pennsylvania and several other eastern US states, and it is thought to be America's most productive play (F&S 2012).[2] In 2011, Pennsylvania's annual gross production more than doubled, surpassing one trillion cubic feet of natural gas (EIA 2012), and making Pennsylvania the top natural gas producer in the Marcellus region (EIA 2012). Pennsylvania farmers have been particularly impacted by corporate practices of leasing land for natural gas drilling access. Farmers' roles as land-use decision-makers make them uniquely attuned to fracking's uncertain socio-environmental outcomes, even as their economic vulnerability makes industry growth seem fortuitous. This is particularly the case for marginalized small-scale farmers, who contend with pressures of poverty, land stewardship, and exclusion from agricultural subsidies. Yet, farmers' experiences with natural gas production have been understudied by social scientists. Neoliberal logic may indeed normalize extraction methods like fracking at multiple scales, leading to public support for policies that align ideologically, like continued commodification of water. Though Finewood and Stroup (2012) provide strong theoretical evidence for normalization of fracking's impacts in Pennsylvania via neoliberal logic, their observations must be tested empirically. I begin to do so here, drawing on extensive fieldwork with farmers in Pennsylvania's Bradford, Susquehanna, and Washington counties.

I assert farmers' experiences with fracking offer unparalleled glimpses into the neoliberalization of nature via natural resource development, especially how related market-based discourses[3] are mobilized in agricultural contexts. Given Pennsylvania's increasing natural gas production, and industry dependence on farmland for drilling, this article focuses on a sample of Pennsylvania farmers who lease their land for natural gas production. In this context, I ask: (1) Among small-scale farmers impacted by hydraulic fracturing, what evidence exists that neoliberal logic helps farmers normalize fracking? and (2) How does normalization interact with decisions to sign natural gas leases? Below I review literature in neoliberal environments, followed by descriptions of study sites and research methods. Utilizing

[2] Estimates of the play's volume fluctuated from 500 trillion cubic feet (Engelder and Lash 2008), to 400 trillion cubic feet (EIA 2011), and now down to 141 trillion cubic feet of recoverable natural gas reserves (EIA 2012). Projections about natural gas volumes on the Marcellus fluctuate continuously, with the EIA reporting sharp declines in projected natural gas volumes, reducing their 2011 estimate of natural gas reserves from 827 trillion cubic feet to 482 trillion cubic feet in 2012 (EIA 2012).

[3] These discourses include privileging free market systems and open trade agreements, de- and re-regulation of the state to make market transactions more fluid, increased financialization of markets, and shrinking state provision of social services and safety nets.

data from in-depth interviews and extended field visits to Pennsylvania farms, I highlight ways in which neoliberal logic helps farmers normalize fracking and how it impacts their land-use decisions. I show how market-based logic helps create perceptions of 'a new normal' in rural Pennsylvania, a 'new normal' that allows small-scale farmers to contend with their lack of agency in natural gas development's rapid development on their land.

Literature review—Pennsylvania's farms and gas fields as neoliberalized environments

This paper utilizes an expanding literature on neoliberal environments (Heynen and Robbins 2005; Heynen et al. 2007; Castree 2008a, b). Neoliberalism here denotes a set of ideologies, while neoliberalization refers to various multi-scalar ways that neoliberalism is implemented in real-world settings. Neoliberal *ideology* asserts free market capitalism's superiority over other socio-economic systems and market-based logic's superiority in decision-making in most contexts (Harvey 2007; Castree 2010). Neoliberal*ism* is formalized via policy discourses, including privatization, marketization, state deregulation, market-friendly reregulation, and creation of self-governing individuals. Policy measures implement neoliberal*ization* via free trade agreements, education supporting marketization, and devolution of federal governance to states and localities (Castree 2008a, b; McCarthy 2005b). These policies facilitate neoliberalism's hegemonic status globally. While neoliberalism has been "fetishized…as a single, monolithic and undifferentiated process" (Heynen and Robbins 2005, 6), it can be best understood as a "diverse and interlinked set of practices that reflects a heightened, evolved, and more destructive form of capitalism" (6). In practice, neoliberal ideologies are deployed in multiple ways, interact with different people and various places, and thus manifest in widely divergent ways through an ever-changing process of neoliberalization. Four dominant relations act as integral components of neoliberal hegemony as it interacts with the natural environment (Heynen and Robbins 2005). *Governance* refers to the role of the state and multiple ways state institutions shape multi-scalar socioeconomic and socio-environmental contexts (Fletcher 2010; Wilder and Lankao 2006; Heynen and Perkins 2005). This includes efforts to deregulate economic sectors like energy and finance, while reregulating other aspects of governance to ease market transactions. Correia (2005) establishes how the US Forest Service mandated industrial, sustained yield forestry using market-based, neoliberal logic, thereby "ensuring free and unfettered access for sustained capital accumulation" (30). *Privatization* refers to the shift of natural resource ownership from the public sector to private firms or corporations (Bakker 2003, 2010; Swyngedouw 2005, 2009), and the shift from state-formulated regulatory and enforcement mechanisms to private ones. Brown and Getz (2008) show how third-party monitoring of food labeling and certification in California represents "privatization of regulatory functions previously reserved for the public sphere" (1184). Third, efforts at *enclosure* aid privatization by coopting common pool resources like land or natural gas under private ownership, typically excluding proximate communities from access (Robbins and Luginbuhl 2005; McCarthy 2005a). In analyzing enclosures within New England fisheries, St. Martin (2005) finds that communities dependent on access to fisheries for their livelihoods suffer under enclosure, especially small fisherpeople as opposed to large-scale operations. Finally, *commodification* of complex, invaluable ecosystems facilitates resource marketization necessary for free trade of land, atmosphere, water, and other "goods" that were once non-commodified (Polanyi 1944; Swyngedouw 2009; Bakker 2010).

US policymakers implemented 'roll-back' neoliberalism in the 1980s, actively deconstructing state government and thereby contributing to increased inequality and poverty (Peck and Tickell 2002). In response, 'roll-out neoliberalism' began in the 1990s, rebuilding the state to accomplish "aggressive reregulation, disciplining, and containment of those marginalized or dispossessed by [roll-back] neoliberalism" (Peck and Tickell 2002, 389). This included natural resource dependent communities and small-scale farmers, like those interviewed here, residing in persistently impoverished counties. As they become increasingly responsible for governance, states and communities must seek private or external funding to support the public good and may also encourage local corporate investment, such as energy leases.

Fracking enables a few of neoliberalism's dominant relations. For example, land leasing by corporations such as Chesapeake Energy and Range Resources leads to privatization and enclosure of newly valued shale resources buried thousands of feet below the surface and has facilitated rapid natural gas development. Enclosure of shale formations has been central to natural gas development, allowing fracking to take place on a variety of lands via leases, eminent domain, and other forms of land appropriation. Valuation, or commodification, of shale gas implicates communities in this enclosure effort, as when small-scale farmers negotiate tensions between land stewardship and economic security provided by lease and royalty monies in an increasingly commodified, yet unpredictable economy.

Devolved governance has been a hallmark of fracking's rapid pace and scale of development in the USA. For at least seven of 15 major federal environmental laws, the natural gas industry is exempted from key statutes (New York Times 2011). When Congress excluded fracking from regulation under the Safe Drinking Water Act Standard in 2005, it made a symbolic gesture towards devolution of

environmental governance from the federal level to state and municipal governments.[4] Thus, Pennsylvania and every other participating state monitors fracking according to idiosyncratic, unstandardized environmental, labor, and safety regulations, while enforcing them with shrinking budgets. This system leads to unclear regulatory and enforcement protocols, as well as under-staffed agencies at the state level.

In Pennsylvania, only one agency—the Department of Environmental Protection (DEP)—is charged with permitting new wells and monitoring existing wells for air, water, and other violations, in a state that has seen unparalleled natural gas development. Since 2005, 8,982 hydrofracking wells have been drilled in Pennsylvania, with 3,025 recorded regulatory violations.[5] Despite these recorded violations, the DEP recently discussed its difficulty enforcing regulations that are still in development, though the natural gas boom began to impact Pennsylvania in 2006 (AP February 2013).[6] As such, the DEP indicates important, ongoing regulatory and enforcement shortcomings generated by a devolved system. With few resources and increased responsibility, evidence also exists that the DEP failed to utilize the most stringent regulatory guidelines at its disposal. For example, amid residents' complaints about water quality reports (Morgan Nov. 2012), investigations uncovered the DEP analyzes drinking and groundwater samples for only 23 contaminants, despite having capacity to test water for 45 contaminants (Morgan Feb. 2013). Pennsylvania's new Auditor General also announced he will perform a year-long audit of the DEP's natural gas regulatory enforcement (Gilmer 2013). As these examples illustrate, devolution can lead to regulatory and enforcement mechanisms that may leave Pennsylvanians exposed to environmental health risks without federal protection. While touted as 'empowering' communities, devolutions and decreased funding for state and local governments leads to reduced capacities to administer social programs and regulatory enforcement they now oversee (McCarthy 2005b; Fletcher 2010). Importantly, this also means that states, municipalities, and even small-scale farms may seek financial support from external or private sources. Pennsylvania's Act 13 provides further evidence of problematic outcomes from devolution of governance and privatization of natural resources. Passed in 2012 and enforced by the DEP, Act 13 includes the following mandates: increased wellhead setbacks; stronger water protection; and "strong, uniform, consistent statewide environmental standards" (DEP 2013). The Act allows municipalities to assess impact fees to address environmental degradation, road damage, and other outcomes of drilling activity. However, seven Pennsylvania municipalities appealed the decision because the Act strips municipalities of the right to zone locally. Standardized environmental regulations require standardized, industry-friendly zoning across the state, it was argued. Despite a state Supreme Court 3–3 tie decision, Act 13 was not overturned. Opponents expressed concerns that communities would be disenfranchised from their right to control local land use, further empowering natural gas corporations and spurring rural industrialization. Pennsylvania Justice Thomas Saylor expressed concerns that the law "could in effect turn private residential communities into industrial zones" (Begos Oct. 2012). Pennsylvania also penalized four of the seven municipalities challenging Act 13 by withholding their portion of the $120 million in state impact fees collected from industry.

Pennsylvania's small-scale farmers find themselves caught at the crux of these tensions, as they own and/or farm the land natural gas companies lease to frack for natural gas. Small farmers[7] struggle economically, due in part to their relatively limited market share and access to subsidies. For example, for the $1.09 billion in agricultural subsidies paid to Pennsylvania farmers between 1995 and 2011, the top 10 % of farming operations in the state collected 59 % of subsidies. The top 10 % earned on average $14,407 on average per year, while the bottom 80 % of farmers (including small-scale operators) collected on average $711 per year in subsidy support (Environmental Working Group 2013). These numbers display small-scale farmers' limited access to agricultural markets and state social safety nets, predisposing them to need financial support from private corporations interested in leasing their land. For small-scale farmers subsisting amid scarce social safety nets, economic vulnerability can, paradoxically, encourage use of neoliberal logic to help normalize fracking, making it more acceptable to sign a lease or 'normal' to graze dairy cows next to a wellhead.

Harvey (2007) and Popke (2011)) posit neoliberalization has been powerful because it connects to notions of individual 'freedom' and "instills [in people] an increasingly narrow and individualized sense of responsibility and ethical agency" (Popke 2011, 243). As the state retreats in de- and reregulated contexts, structural constraints require people to become more 'free', atomized, or self-governing. Individualized work ethics and narratives of market-based self-sufficiency lead to a "remoralization of the poor" (Castree 2010, 11), through which people feel solely responsible for

[4] The Environmental Protection Agency (EPA) is now engaged in several regulatory review processes related to different phases of the technology, including air emissions, chemical disclosure, and wastewater. Regulations addressing air pollution from natural gas drilling will not take effect until 2015 and results of EPA inquiries will not be available until 2014.

[5] http://stateimpact.npr.org/pennsylvania/drilling/

[6] Accessed at: http://www.shalereporter.com/government/article_76c2da86-6ed1-11e2-82de-0019bb30f31a.html on 4 February 2013.

[7] Defined here as farmers with operations under 1,000 acres.

economic (and other) success or failure. For economically vulnerable small-scale farmers in Pennsylvania, highly individualized senses of responsibility may encourage market-based logic as they balance leasing options with potential impacts of fracking. This may usher in a 'new normal' centered on hydraulic fracturing, wherein leasing and drilling coexist with agriculture.

Yet, activists have been shown to resist neoliberalism, creating sites of *resistance* to neoliberalism's relations of production (Castree 2010, 2008a, b). Movements against neoliberalization have related to water privatization and delivery (Bakker 2003, 2010; Perrault 2008; Prudham 2004), forest management (Heynen and Perkins 2005), mining (Bury 2004), and inequality in agriculture (Brown and Getz 2008; Harrison 2008). In his analyses of commons and rural locations as spaces of alterity, McCarthy (2005b, 2006) portrays rural communities as amenable to alternative economic structures and consistent sites of Polanyian re-embedding. As Guthman (2008) warns, however, the local has long been romanticized as a site of radical resistance and revolution.

Emerging evidence highlights grassroots sites of *acceptance* of neoliberalization and displays how people can respond favorably to market-based logic. McCarthy (2005a) finds that community forestry sites can be "hybrids between neoliberalism and…natural resource management" (995) in the USA. First Nation Alaskans also adapted neoliberal worldviews regarding their fisheries (Mansfield 2007). In her study of community responses to oil development in pristine areas of Ecuador, Valdivia (2004) showcases interactions between cultural practices and neoliberalization processes, analyzing how indigenous identities accommodated market-based logic to further socioeconomic and socio-environmental security. Importantly, Murray (2002) showcases how impoverished small-scale Chilean farmers adapted to neoliberal policies in response to increasing inequality. In the USA, Holifield (2004) examines EPA treatment of hazardous waste, concluding that even environmental justice advocates may increasingly utilize market-based logics. Finally, Guthman (2008) shows how policies encouraging healthier eating in California contribute to "neoliberal subject formation" (2008, 1171).

Foucault (2008) and Fletcher (2010) offer additional insight into the power of neoliberal logic and, for purposes of this research, its role in creating a 'new normal' via neoliberal governmentality. Foucault asserted neoliberalization occurred not through shrinking the state but through its *active*, *constant interventions* to create structures facilitating free markets, representing a new 'art of government.' Under neoliberal governmentality, decisions filter through cost–benefit frameworks, normalizing market privilege and impacts of development. In this context, the state could 'conduct conduct'—as citizens internalized norms of market-based logic, prioritization of economic development, and increasingly interpreted these as part of what I term a 'new normal'.

Neoliberalization and neoliberal governmentality may combine to create stakeholders who "self-regulate their behavior in ways consistent with neoliberal logic" in the context of fracking (Fletcher 2010, 175; F&S 2012). Finewood and Stroup assert neoliberal logic helps normalize fracking's impact on the hydro-social cycle in Pennsylvania (2012; Swyngedouw 2009), specifically fracking's relationship to water pollution and waste. Further, "opponents of fracking are discursively framed as irrational and unwilling to absorb necessary costs that would benefit their neighbors and the nation as a whole" (F&S 74). This can be felt with special keenness in tight-knit farming communities where land leasing for drilling has become a central concern. Below, I show how for some farmers negotiating livelihoods among natural gas wells in Pennsylvania, neoliberal logic helps normalize the rapid pace of fracking, decisions to lease their land despite uncertainty, and concerns over impacts to water, livestock, and land.

Methods and study sites

This study is based on triangulated data collected in Pennsylvania's Bradford and Susquehanna Counties in the northeast and Washington County in the southwest. Bradford and Susquehanna Counties are embedded in the 'Endless Mountains' region, a scenic agricultural area. Both counties have long histories of natural resource dependence, and forestry, agriculture, and now tourism are central to the local economy. The natural beauty of the region and its rural character draw tourists. Even with substantial natural gas development, forestry, and agricultural efforts like dairy farming and small-scale crop farming, the region remains one of the most persistently poor in Pennsylvania[8] (US Census Bureau 2012; Brasier et al. 2011). Small-scale farmers are particularly marginalized populations here; 49 % of subsidies go to the top 10 % of agricultural producers, with the bottom 80 % of producers in Bradford County receiving only $823 per year in subsidies (EWG 2013). Their market access is further complicated by rural location (Brasier et al. 2011). Perry (2012) finds that unconventional natural gas development in Bradford County leads to "negative sociocultural and psychological impacts" (81) and even collective trauma for agricultural landowners, including changes to quality of life. Yet, we know little about how trauma interacts with hegemonic neoliberal logic or how market-based narratives may help agricultural households contend with disruptive impacts of development.

[8] For example, Bradford County's median household income is $40,543, compared to a state-wide average of $50,398. Their poverty rate is 13.6 %, while Pennsylvania's is 12.4 % (US Census 2010).

Washington County is more urban than northeastern study counties, located near the Pittsburgh metropolitan area. The county boasts a more diversified economy, depending on natural resource development along with employment in service, medical and higher education, and technology (US Census Bureau 2010). This region supports sizeable sustainable agricultural and niche farming markets, contributing to uncertainty about fracking and its environmental health effects (Hopey 2012). Washington County presents an important comparative case regarding normalization of fracking, with its more diversified economic base and more urban population. Still, Washington County's small-scale farmers face many of the same structural barriers to economic stability. For example, farmers in the bottom 80 % of producers receive only $190 per year on average in subsidies, as compared to the top 10 % of producer's $5,836 per year average (EWG 2013). State support and wealth concentrate among large producers in Washington County, where 10 % of producers collected 66 % of federal subsidies between 1995 and 2011 (EWG 2013). The minimal evidence available to date suggests natural gas development in Washington County has been welcomed economically, but seen as disruptive to environmental well-being, human health, and organic or sustainable agricultural markets (Hopey 2012).

Ethnographic data collection and case study methods were used. My research team chose Bradford, Susquehanna, and Washington Counties after identifying overlaying concentrations of farms and drilling activity using ArcGIS. Data include archival documents; in-depth interviews with farmers, agricultural experts, and community liaisons such as Extension Educators; and participant observation and farm site visits throughout our study regions. All interviews and site visits were conducted by a research team, with primary and secondary interviewers.[9] In-depth interviews were conducted with 47 individuals, selected using a multi-stage process from which we built a database of regional farmers. Small-scale farmers were identified using Pennsylvania State University's AgMap,[10] Local Harvest,[11] and Manta,[12] and purposive sampling and snowball sampling were utilized once in the field until saturation points were reached. Interviews lasted 1 to 2 h, were conducted at people's farms or offices, and recorded verbatim. We asked farmers a range of questions, inquiring about their farm, their leasing experiences, their trust in corporations, and their positive and negative experiences with natural gas development on their farms.

Interviews and ethnographic field notes were transcribed and analyzed for emergent themes, with each transcript read a minimum of three times by each researcher. Codes were generated, compared, and refined by a team of three researchers, leading to a coding scheme and data analysis plan with strong inter-rater reliability. Coded data were then entered into NVivo Qualitative Analysis software, allowing us to rigorously identify patterns in farmers' perceptions of fracking and its impact on their livelihoods. Participant observation and extensive field visits to farms and fracking sites allowed further 'checks' on the validity of emergent themes. Ethnographic fieldwork also provided invaluable opportunities to observe fracking, industrialization of rural landscapes, and farming operations.

Findings and analysis—neoliberal logic and normalization of fracking on Marcellus shale farmland

Several key findings emerged about farmers' experiences with natural gas development, particularly fracking. Emergent themes suggest that most farmers do normalize impacts of unconventional gas development generally and fracking specifically, here when deciding whether or not to lease farmland. Because many farmers interviewed here utilize market-based neoliberal logic (Foucault 2008; Fletcher 2010; F&S 2012), they develop rational cost–benefit frameworks for assessing fracking's local and regional impacts. Normalization of fracking's outcomes emerged most saliently in relation to environmental outcomes and economic development, analyzed below. Data suggest farmers create active sites of acceptance for rapid energy development. Importantly, however, many small-scale farmers in our sample utilized neoliberal logic while faced with persistent economic vulnerability and poverty. Experiencing relative marginalization and familiarity with natural resource dependence in their communities, market-based logic helps many of the small-scale farmers interviewed here establish feelings of agency and control over their livelihoods.

Environmental outcomes[13] and normalization

Normalization of fracking's environmental outcomes emerged as one key theme among farmers in

[9] For this study, data collected during the latter two phases of research are analyzed. The first phase of research involved extensive content analysis of archival data, demographic, and historical information related to study regions. To capture local, regional, and national coverage and perceptions of hydraulic fracturing and shale gas development, coverage in local county newspapers as well as national coverage in outlets like the New York Times was systematically collected and analyzed.

[10] http://agmap.psu.edu, which elicited results for a wide range of farm types (conventional, organic, and sustainable) and sizes (small, medium, and large).

[11] www.localharvest.com, which elicited results for small-scale, organic/sustainable farms.

[12] www.manta.com, which helps track primarily large-scale, conventional agricultural operations.

[13] Environmental impacts include impacts to the built environment (truck traffic, road damage, light, and noise pollution) and impacts to the natural environment (like water and air pollution, aesthetics, and natural resource dependence).

Pennsylvania.[14] Most farmers sampled here argued that environmental impacts had been sensationalized by the media and irrational residents with too much concern for the environment. They displayed normalization of fracking's impacts using two narratives marked by neoliberal logic: one that completely rejected claims of environmental impacts, and another discourse that recognized environmental impacts but balanced them against more salient economic development needs.

The first strand of narratives rejects assertions about fracking's detrimental environmental impacts, framing them as irrational fears. Often, farmers connected their narratives with patterned normalization of pollution in the region related to long-term natural resource extraction. For example, a sustainable crop farmer with leases in northeastern Pennsylvania argued that fracking's negative water quality impacts were dramatized and that flammable, methane-contaminated water was common in the region due to decades of coal mining. He explained, "You know…everyone's all excited about the water in Dimock.[15] But there were people there lighting the water in their kitchen sink long before the gas companies showed up…That's been going on for 100 years…But these transplants come in and think it's horrible." Another small-scale but conventional farmer in southwestern Pennsylvania, once in dairy and now in crops and alfalfa, argues "even as a kid, you could never drink the water because the coal mines ruined the water…You hear stories about people's cows dying from fracking, but I personally can't name you anybody that's lost an animal." Observed another sustainable livestock farmer in a northeastern county, "They [corporations] make such a small footprint on the environment for what they're bringing up….and for the uses. It's not like the old strip mining coal." These observations showcase normalization of fracking via neoliberal discourse, while simultaneously displaying the region's long-term familiarity with environmental degradation related to energy development. Thus, small-scale farmers in our sample operate in contexts where natural resource dependence and its environmental outcomes have been normalized for decades.

Many farmers in our sample asserted that environmental concerns are based on irrational opinions, not facts. These narratives lend empirical support to Finewood and Stroup's observations that people who do not normalize fracking or utilize neoliberal logic are framed as irrational. Said one female sustainable livestock farmer from a northeastern tier county, "Friends of ours…they were having meetings with people where they were saying 'Oh, it's destroying the water,' but it's opinion, not fact. I'm not wasting my time with that." Many farmers expressed beliefs that activists are uninformed and dismissed them as "treehuggers." Reflecting on recent protests near her farm, one female dairy farmer in a northeastern tier county observed, "There was a certain well that protestors were at …It's ridiculous, you know?" Said another farmer, "The only tensions are from the nutcases that think this stuff [fracking] is going to kill everybody…Now people, about 50 % know that won't happen and what was unknown fear is now factual reality…But you still have those nutcases." Neoliberal logic that frames non-market-based assessments as irrational helps farmers normalize fracking's potential environmental outcomes, as highlighted here.

A second strand of narratives recognized environmental degradation related to fracking, but rationalized it within a cost–benefit framework and sense of self-regulation and atomization (Fletcher 2010). When balanced against perceived economic gains, environmental degradation was seen as a necessary cost, with many farmers in our sample displaying market-based neoliberal logic. When asked about water and air pollution, a male sustainable farmer with multiple leases noted the powerful antidote of a royalty check when he said, "Now it's not the emotional, reactionary stuff, now it's facts. People have seen the pipelines, seen the compressor stations, the well pads. People are getting royalty checks, they've seen a lot of the impact but their kids are working for gas companies." Another sustainable livestock farmer from the northeast commented on her cost–benefit approach to environmental degradation, stating "Noise pollution, other pollution, it's a temporary thing. If you've got a drillbit in your backyard, it's going to make some noise. It's also going to pay you royalties for the next thirty years. It's like, three months noise, thirty years royalties—it's a no-brainer!" For some farmers, neoliberal logic helped create cost–benefit analyses where royalties outweighed concerns about environmental impacts, showcasing how economic vulnerability can keenly impact small-scale farmers' perceptions of fracking and decisions sign leases.

Other farmers interviewed utilized cost–benefit frameworks in which environmental degradation was balanced by corporate attention or their own willingness to monitor and test groundwater and soil. One conventional hay farmer from Washington County noted that evaporation ponds on his property had been leaking but normalized that outcome utilizing neoliberal logic about corporate honesty: "Initially they had some of these frack ponds with leaking liners…But the gentlemen who installs them told me 'If you have a problem, we do double and triple lining, it is environmentally taken care of. [The company] will do anything to keep the peace and to do it right'." A sustainable livestock farmer utilized similar market-based logic when analyzing impacts

[14] Interview questions asked farmers what sorts of environmental impacts, if any, they had witnessed on their land and in their communities.

[15] Referring here to Dimock, Pennsylvania, the subject of Josh Fox's sensationalized documentary *Gaslands*.

on the built environment. He commented, "We got our road torn up because they were hauling material. And they [company] told the town 'Fix your road, give us the bill.'…They fixed the road, made it better than it was…A lot of the roads around here are in better shape than they have been." One small-scale, sustainable crop farmer commented, "The process is a little inconvenient at the moment, but anything that they messed up that was inconvenient or dangerous to me, they compensated us for it." For these farmers, market-based logic helped them overlook affronts to their land and control over it by encouraging them to focus on market-based compensation practices.

Adopting neoliberal ethics of self-regulation, some farmers monitored their water and soil for environmental outcomes. For example, a conventional alfalfa and hay farmer discussed his pursuits to monitor his family's well-being amid environmental risk. As he explained, "I have been to dang near every meeting. I have educated myself….We spent $1,800 to get two wells and a little spring down there tested down to radioactive nuclides, very intense. I wanted to make sure we weren't poisoning ourselves and our animals." Small-scale, sustainable crop and dairy farmers noted that though they had signed leases for drilling on their land, they felt "like guinea pigs" when monitoring their water and well-being of their livestock for signs that nearby wells had leaked. Yet, they needed the leases for the royalties. Several other farmers discussed individual water-monitoring efforts, even displaying printouts and discussing results during interviews. These responses show how neoliberal logic helps small-scale farmers normalize environmental degradation. They also display how neoliberal logic can improve farmers' perceptions of agency and control, and highlight how impacts of devolved governance and underfunded municipal and state agencies are reframed in context. Overall, this section provides strong empirical evidence that environmental degradation related to fracking has been normalized in context, including rejection of environmental claims because they are 'irrational' and utilization of cost–benefit analyses or self-monitoring.

Economic outcomes and normalization

A vast majority of farmers interviewed in our sample viewed natural gas production via fracking as an economic boon. Normalization of fracking's impacts relies on perceptions that economic growth and development have and will continue to emerge from natural gas production. Farmers believe that fracking and gas development represent economic progress for impoverished communities and assist farmers in keeping their land and livelihoods. Further, neoliberal normalization encourages inattention to the boom-bust nature of extractive economies, while depending upon trust in private natural gas firms to invest sustainably in local communities.

Most farmers asserted fracking will lead to economic progress for the region. They take great pride in regional natural gas powering the world and emphasize the significant role the region will play in future energy development. Said one conventional dairy farmer, "I look at it [fracking] as progress, and you can't stop progress. You can bellyache and complain…but now they're telling us there's oil under there too…So I think it's a great thing." Another sustainable livestock farmer tied fracking to regional and national freedom when he asserted, "If it's done properly, not only agriculture, but I hope communities benefit immensely. I feel what they're [corporate projections] telling us is really true. That there is enough natural resources within our boundaries…that can make a huge difference on our dependence on foreign oil." As displayed here, narratives of progress and market-based freedom help normalize hydraulic fracturing and persuade farmers to sign leases.

Discourses also emerged that natural gas development helps area families and will lead to enhanced stability and even global influence for Pennsylvania, including its impoverished communities. Said one conventional farmer in a northeastern county, "Our son's working on a gas job right now. And there's been local folks who have had better jobs than they ever thought possible around here because of this…Susquehanna County was one of the poorest counties in the state and is now destined to be probably the richest county in the state." Farmers in Washington County expressed similar optimism, normalizing fracking's rapid pace of development. Said one conventional dairy farmer, "We had one engineer who told us it [Marcellus development] was going to be here for 100 years and that was eight years ago. He said 'You have no idea what you have down here'…But we understand this is the Saudi Arabia of natural gas. We know what comes out of these wells is going to change how we drive cars….Manufacturing is going to change. Globally it is changing. China is here watching how [corporation] does this. It is going to change the worldwide economy." As these comments show, buffered by neoliberal logic of economic growth, small-scale farmers adeptly normalize fracking's rapid expansion and leasing their land to facilitate it.

Farmers expressed the strongest support for fracking because leases brought much-needed income to their households, often allowing them to keep their land, expand their operations, or shift to less labor-intensive forms of farming. A northeastern tier sustainable livestock farmer asserted natural gas leases from fracking are "a lifesaver for farmers….everyone here is my age [over 60] and getting tired." One female dairy farmer commented that economic benefits from leasing her land for fracking led her to support the practice: "I have mixed feelings, but I have seen how it has helped farmers. I am thrilled about that because nobody works harder than we do…Some farmers are able to pay

bills they haven't been able to before…We've never had a steady income before." Most farmers reported using lease money to pay off farm debt or re-invest in their farm, allowing them to normalize leasing based on its benefits to their households. Another northeastern tier small-scale farmer utilized market-based logic to analyze fracking's impacts when he observed "some farmers that have received royalties have sold their house and retired…Other farmers have taken the money and bought new equipment and that's positive for agriculture." Another farmer painted a vivid picture of private corporate money, its appeal, and the temptation to normalize fracking and leasing when he observed, "I mean they [corporations] come through and they pretty much just walk down the street and hand everybody money. Here's 100 k, here's 80 k, here's 50 k." Not only does leasing help households, farmers assert it helps the community as well, easing their normalization of fracking and leasing. One farmer described a local boom in employment: "Everything from entrance level jobs to the engineers… marking, mapping, clerical…if it isn't directly related to the industry itself, it's the byproducts. The hotels are full, every rental is full. And they're staying in the community." Clearly, small-scale farmers in our sample use neoliberal logic to normalize fracking's impacts and rationalize their decisions to lease land.

Leasing and normalization of loss of agency—a 'new normal'

About 95 % of the farmers we interviewed had signed leases, were in the process of signing, or were impacted by leases near their productive land. There was a palpable sense among most farmers that fracking and natural gas development introduced a new way of life. For example, when asked about fracking's local impacts, a northeastern county sustainable crop farmer with two natural gas leases replied, "When they [the natural gas companies] came here, they came with a one hundred year plan…So they're going to be here long term. Things will settle down, and we'll settle into a new normal. And that will be fine, and everyone who comes along will think that's normal." A sustainable farmer in southeastern Pennsylvania commented on the need for change, normalizing the rapidity and scale of fracking in his state and the nation. He said, "People don't like change, but people came in here without electricity or running telephone line. We wouldn't have all the normal things we have today…if someone hadn't been courageous enough to say, 'We'll do the change.'…It's [fracking's] worth the change."

Importantly, most small-scale farmers interviewed felt they had little control over the process, making it more desirable to normalize fracking rather than experience anxiety or aggression. In reference to her decision to sign a lease, a sustainable chicken and pig farmer said, "Us normal people…well, we can't do anything about it [fracking] anyway." When asked about fracking's rapid development and her decision to sign a lease, another sustainable, small-scale farmer said "You just do what you gotta do, and I can't do anything to stop them, so I make the best of it." While signing leases is common among Pennsylvania farmers, data indicate that tendencies to normalize environmental impacts and balance them with economic growth facilitate leasing one's land. Still, most farmers (feel compelled to) express optimism about the 'new normal'; most in our sample expressed resignation that fracking and rapid energy development appear to be the new norm.

Discussion and conclusions

This article addresses the following research questions: (1) Among small-scale farmers impacted by hydraulic fracturing, what evidence exists that neoliberal logic helps farmers normalize fracking? and (2) How does normalization interact with decisions to sign natural gas leases?. Our data provides evidence that small-scale farmers normalize fracking's impacts using market-based logic, and that such normalization persuades small-scale farmers to sign leases. Feeling a deficit in economic agency or control, small-scale farmers we interviewed used market-based logic to recapture a sense of agency when signing leases they perceived to be inevitable.

In this way, neoliberal logic helps make rapid natural gas development seem like the 'new normal'. This paper establishes that normalization of fracking's environmental impacts occurs through outright rejection of environmental impacts or characterization of concerned individuals as irrational. Further, farmers interviewed here used market-based logic to weigh environmental impacts against economic benefits, leading marginalized small-scale farmers in our sample to conclude that immediate economic needs—and receipt of lease monies—outweighed less 'rational' environmental outcomes. Neoliberalization's power emerges because it connects to notions of individual 'freedom' and "instills [in people] an increasingly narrow and individualized sense of responsibility and ethical agency" (Popke 2011, 243). Our data indicate that neoliberal logic, especially individualized economic responsibility among our sample of farmers, contributes to normalization of fracking and decisions to sign leases allowing fracking on their farmland.

Thus, a majority of farmers in our sample support the proposition that neoliberal logic helps normalize fracking's outcomes, including water pollution (F&S 2012).[16] In the

[16] Importantly, though it could not be analyzed in the space of this article, a small portion of the farmers interviewed did *not* normalize fracking's environmental and economic development outcomes, instead expressing concerns about environmental risk and unstable boom-bust economies that depend on natural resource extraction. These divergent patterns will be analyzed in later articles.

context of fracking's rapid development in the USA, our evidence does indeed suggest that neoliberalization and neoliberal governmentality combine to create stakeholders who "self-regulate their behavior in ways consistent with neoliberal logic" (Fletcher 2010, 175; F&S 2012). Here, neoliberal logic encourages small-scale farmers to facilitate fracking, persuading them to see fracking's current role in rural industrialization, its potential environmental and health outcomes, and its economic outcomes as part of a 'new normal' in which they participate. Their cows now graze and their crops now grow in the shadow of wellheads, but small-scale farmers can keep their farms or claim economic empowerment. Indeed, normalization of fracking for small-scale farmers emerges from their economic vulnerability and socioeconomic constraint, but it results in rapid development of natural gas extraction.

While evidence presented here is compelling, further research must now differentiate between farmers of various genders, ages, geographical locations, and type and scale of operation. For instance, scholars must examine gender differences in perception of fracking's outcomes and how they are deployed in agricultural settings. Further, comparisons between large- and small-scale farmers and 'newcomer' and 'oldtimer' farmers will elucidate variation in utilization of neoliberal logic. Research into other impacted occupational groups—such as industry and service workers—and general community groups as well will help establish the role of neoliberal logic more widely. While additional research is needed, this article establishes that normalization of fracking's impacts can be observed among small-scale farmers in Pennsylvania, as they utilize neoliberal logic when deciding to lease their farmland for hydraulic fracturing and natural gas development.

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