

Busted Amidst the Boom: The Creation of New Insecurities and Inequalities within Pennsylvania's Shale Gas Boomtowns*

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Abstract: In the mid-2000s new technological innovations newly enabled the extraction of natural gas through the use of hydraulic fracturing within gas-bearing shale and other unconventional reserves. As a consequence, many places, often in economically lagging rural areas, have seen dramatic change as they are transformed through “boomtown” development. Although scholarship on boomtown development has long explored social disruption associated with the sudden influx of workers and the rapid economic development, this literature has tended to overlook the ways in which such development can in fact create new poverty, inequalities and insecurity. This paper, through an examination of community change within Pennsylvania’s Marcellus Shale region, uses key informant interviews and institutional secondary data to explore the creation of new poverty and insecurity precisely as a consequence of rapid economic “boomtown” development.

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Busted Amidst the Boom: The Creation of New Insecurities and Inequalities Within Pennsylvania's Shale Gas Boomtowns

Despite the major metropolitan centers of Philadelphia, in southeastern Pennsylvania, and Pittsburgh, in the western part of the state, much of central and northern Pennsylvania is made up of large rural areas, including small towns, agricultural communities, and counties with legacies of timber and oil and gas resource extraction economies. The people and communities across many of these rural areas have for many years suffered from lagging economies, gradual processes of outmigration, aging populations, and increasingly limited economic opportunities. In the mid-2000s however, much of rural Pennsylvania was presented with what appeared to be an unprecedented opportunity in the form of new possibilities for natural gas extraction from gas-bearing shale formations. In the case of Pennsylvania, nearly two-thirds of the state is located on top of the Marcellus Shale formation, a layer of sedimentary rock about a mile beneath the earth's surface that previously had been thought to be an economically and technologically non-viable "unconventional" gas reserve.

Unconventional gas reserves are those in which natural gas, instead of being trapped by a geology and concentrated in a particular place, is instead contained within and *throughout* a geology, such as sandstone or shale. Beginning in the late 1990s and early 2000s, a combination of existing technologies, specifically horizontal drilling and hydraulic fracturing, were further developed and refined in ways that transformed unconventional gas reserves previously thought to be too costly and technically challenging to develop into unimagined new energy resources (Harper, 2008; Waples, 2012). Using these methods well bores can be drilled a mile or more beneath the earth's surface and then a mile or more horizontally along the targeted geology (such as a shale layer). Water, along with added particulates and chemicals including lubricants, biocides and corrosion inhibitors are pumped at high pressures into the well bore where the water fractures the target geology, releasing the gas contained within, which then flows to the surface. The process is a highly industrialized activity, with each well typically requiring between three and five million gallons of water, about 10-30 percent of which ((as much 100 to 300 million gallons per well) returns to the surface and must be disposed of or repurposed for additional well fracturing¹. Although the horizontal drill techniques necessitate fewer well pads overall, well pads may cover several acres and can require as many as 4,000 heavy equipment trips to construct the pad, haul water, drill and fracture the wells, and reclaim the site (Schafft, Borlu & Glenna, 2013). The process has raised serious questions about both environmental and social impacts, and in particular the risk of both ground and surface water contamination.

In the case of Pennsylvania, the Marcellus Shale was transformed from relative geologic obscurity into what was recognized as the largest unconventional gas reserve in the United States, and one of the largest reserves worldwide (Brundage, et al. 2011; U.S. Energy Administration 2012). Whereas in the early 1990s the estimated amount of recoverable gas

¹ The flowback contains chemicals from the fracturing compounds as well as brines, heavy metals and naturally occurring radioactive materials that may also be contained in the shale beds. Chemicals used in the fracturing fluid have been held as proprietary secrets. However, in June 2010, the Pennsylvania Department of Environmental Protection made publicly available the list of chemicals and additives used in hydraulic fracturing, including carcinogens, volatile organic compounds, and endocrine disruptors, many of which have been linked to cancer, as well as respiratory, nervous system, immune system and cardiovascular health problems.

within the Marcellus Shale formation was less than two trillion cubic feet (TCF) by the mid-2000s estimates ranged as high as 489 TCF or the equivalent of about two decades of domestic natural gas demand (Coleman et al. 2011; Engelder 2009, Milicy and Swezey 2006). Unconventional gas drilling began in Pennsylvania in earnest in 2007, and by late October, 2014 there were nearly 8,600 unconventional gas wells been drilled across the state².

As drilling was initiated, new estimates of the shale play productivity were quickly used as the basis for predictions regarding the economic impacts that unconventional gas development might have. Simultaneously, a range of institutional actors, from local government leaders to gas industry advocates, to state policy makers suggested how unconventional gas development could be the answer to the state's economically lagging rural areas. In 2009 a Penn State University report suggested that over ten years the gas industry could contribute as much as \$13 billion to Pennsylvania's economy, creating 175,000 jobs annually, and providing nearly \$12 billion in state and local tax revenues (Considine, Watson, Entler and Sparks 2009). The report's authors argued, "large-scale development would reshape the economic landscape of the state, transforming the Commonwealth to a net natural gas exporter while creating hundreds of thousands of jobs and generating billions of dollars in additional output, income, and tax revenues" (p. 32). Although the report was later criticized when it was revealed that it had been funded by the gas industry advocacy organization the Marcellus Shale Coalition (Barth 2012; Wilbur 2012), its message was reiterated in various ways by other supporters of the industry in Pennsylvania and elsewhere, and also by the state government under the leadership of the aggressively pro-gas governor Tom Corbett who stated his desire to turn Pennsylvania into the "Texas of the natural gas boom" (2011, p. 6).

By June 2011, a report released by the Pennsylvania Department of Labor and Industry stated that 48,000 jobs had been created by the Marcellus Shale Industry (2011). However, this figure was disputed by a report published by the Keystone Research Center which argued that the reported figure included hires replacing workers who had retired, quit, or who had been fired, and that the actual number of *new* jobs created by the industry was no more than 10,000 (Herzberger, 2011). A more recent report suggested that job growth and economic impacts were more pronounced in areas experiencing the greatest intensity of drilling activity with the greatest employment gains in the drilling sector. However, the report also noted that state income tax return data indicated that the total increase in employed residents was modest at best, "suggesting that many of the new jobs being created were going to non-residents who either commuted into the county or were just living there temporarily" (Kelsey, Hardy, Glenna, & Biddle, 2014, p. 1). Further it suggested that the bulk of local revenues generated from the gas industry were in the form of leasing income which in many cases was not being circulated back into local economies (Kelsey, Shields, Ladlee, & Ward, 2011). In northern Bradford County where some of the most concentrated drilling occurred, between 2007 and 2010 a \$143.5 million increase was reported by county residents in rents, royalties, patents, and copyrights income, while by comparison a \$39.7 million increase was reported in gross compensation income (Kelsey, Hardy, Glenna, & Biddle, 2014, p. 2).

² Gas drilling SPUD data obtained through the Pennsylvania Department of Environmental Protection online reporting services.

Energetic debates concerning the ultimate economic impacts of shale gas development have thus typified much of the public and policy discourse in new and emerging “boomtown” gas communities such as those in the Marcellus Shale region and elsewhere (Kinneman, 2011). Almost ignored, however, is the way in which boomtown development can create new kinds of economic insecurity and exacerbate existing inequalities and poverty conditions. This is true within mass media coverage of shale gas development, local-level community discourse in which the common wisdom is that “anyone who wants to work can get a job,” as well as within the broader scholarly literature on boomtown development. As such, these discourses represent one more way in which poverty and insecurity is rendered invisible. This paper takes on the question of how to understand the creation of new poverty and insecurity amidst rapid economic growth, using the Marcellus Shale gas communities in Pennsylvania as its case. I first review the literature on boomtown development, paying particular attention to what that literature has to say about social disruption in the context of boomtown development. I then turn to data collected over the last four years of fieldwork in some of the communities in Pennsylvania most impacted by shale gas development. I conclude with a discussion of the implications for both scholarship and public policy.

Boomtown Development, Economic Development and Social Dislocation

Boomtowns are places that have experienced rapid economic growth and demographic change, most typically (although not always) as a consequence of natural resource extraction activities (Broadway & Stull, 2006; Brown, Dorius, & Krannich, 2005; Brown & Schafft, 2011; Kinchy et al., 2014; Perdue, Long, & Kang, 1999). The academic literature on boomtown development dates back to the early 1970s and initial work done by social scientists and community development professionals on the impacts of rapid energy development in the intermountain West (see, e.g., Cortese & Jones, 1977; Freudenburg, 1981; Gilmore, 1976; Kohrs, 1974), activity spurred by sudden spikes in energy prices and new pressures to fill consumer demands. Much of the initial focus of work was devoted to the ways in which boomtown development created various types of social disruption, and the impacts on communities and longer-term residents. Early work noted, despite economic expansion, and often in historically economically-lagging areas, the mostly negative consequences of rapid economic and demographic expansion in boomtown communities, including rising divorce rates, increases in crime, drug and alcohol abuse and domestic violence, and the negative effects on local community solidarity. This work also tended to document the ways in which local institutions such as schools, law enforcement, mental health, and social service providers experienced unprecedented strains.

Building off of this initial work, was a second strand of scholarship (Schafft, Borlu & Glenna, 2013) that tended to be more social-psychological in nature and focused more directly on the ways in which individuals have perceived, reacted and adapted to rapid boomtown development (Jacquet & Stedman, 2014). Some of this work for example examined how cyclical phases of economic expansion and contraction contributed to feelings of sense of place, individual agency, and personal efficacy (Krannich & Luloff, 1991), while other work has looked at psychological resiliency and adaptation across age lines (Freudenburg, 1984). A third major strand of work has examined boomtown growth and the social and economic consequences across what has been termed the boom-bust-recovery cycle. This work has

focused on the ways and extents to which communities have adapted not only to the initial expansion but also to the economic contraction occurring once the initial economic development “boom” has ended (Brown, Dorius, & Krannich, 2005; Brown, Geertsen, & Krannich, 1989; England & Brown, 2003).

In short, while some of the larger boomtown scholarship addresses the ways in which boomtown development can create various kinds of social disruption, and how boom-bust cycles can leave communities in worse economic straits than they were before the initial expansion (James & Aadland, 2011) – that is, how economic distress is created in the context of the natural resources “bust” – there is remarkably little explicit attention paid to the mechanisms by which boomtown economic development can *simultaneously* create new kinds of insecurities and poverty. However, risk and opportunity within boomtown environments are unevenly distributed across people and communities (Schafft, Borlu & Glenna, 2013), with some persons disproportionately exposed to a variety of economic and social risks and others disproportionately exposed to a variety of (primarily) economic benefits. In the Marcellus Shale region, those who stood most to benefit from the gas industry included landowners who could lease land for drilling – and in some instances became “shallionaires” as a result (McGraw, 2011; Wilbur 2012) – able-bodied adults with particular skill sets such as welding and truck driving, landlords with rental properties, and small business owners and entrepreneurs associated with support services for the gas industry. Those most at risk of a variety of social and economic risks have included renters, the disabled, those on fixed incomes, the unskilled, and women.

Methods and Data

The data drawn from for this paper come largely from fieldwork conducted since 2011 within most of the Pennsylvania counties experiencing the greatest concentration of unconventional gas drilling, including in the northern part of the state, in Bradford, Lycoming, Tioga and Sullivan Counties, and in the Southwest, in Washington, Greene and Fayette Counties (see Figure 1). The data gathering has included focus groups with educators and educational administrators, vocational education coordinators, guidance counselors and high school students, as well as key informant interviews with community members, clergy, social service workers, county-level food banks and pantries, and housing agency staff – in total nearly 40 youth across four school districts in Northeastern and Southwestern Pennsylvania, and well over 100 adult respondents. The most recent iteration of this work has involved interviews with low income adults from Lycoming, Bradford, Washington and Greene Counties which combine both structured and unstructured approaches, as well as life history calendar techniques (Axinn & Pearce, 2006; Corbin & Strauss, 2008). To date over 20 of these interviews have been completed, with a projected 30-40 interviews ultimately to be completed over the next several months. For much of the discussion that follows in this paper I draw rather heavily on these data from conversations with low income residents in Lycoming, Bradford, Washington and Greene Counties.

Interviews and focus groups were digitally recorded and transcribed and, along with accompanying field notes entered into a qualitative data analysis software package where the text was open coded for various community and local impacts associated unconventional gas and industrial development. Axial coding was completed to assign codes for mentions of

demographic, infrastructural, economic and institutional change. While the current focus on the experiences of low income households and individuals is ongoing and still incomplete, these are the data principally drawn from for this paper (along with a primary focus on the four counties in which this work is being completed). I also incorporate some descriptive analyses of institutionally-gathered data within this discussion, some publicly available and some provided directly by county-level institutions.

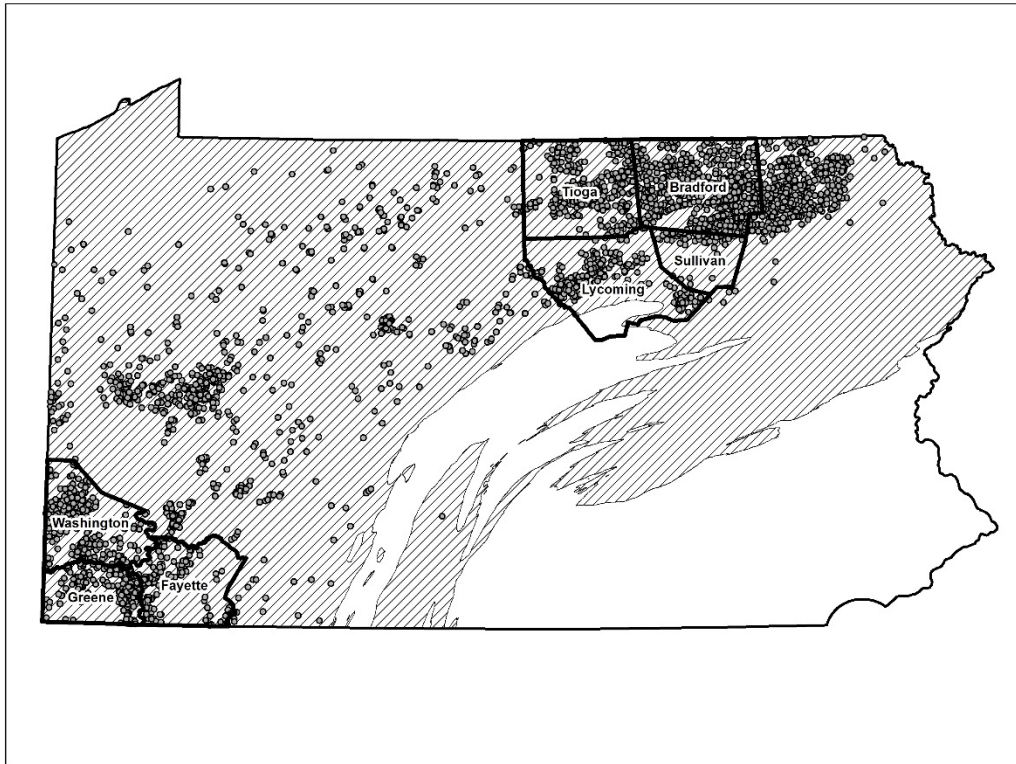


Figure 1. Map of Pennsylvania showing the geologic extent of the Marcellus Shale formation, county study areas (inset), and Pennsylvania Department of Environmental Protection SPUD data indicating the geography of unconventional gas drilling through 2013.

Marcellus Shale, Economic Development, and Poverty

As Figure One suggests, shale gas development has not proceeded evenly across the state. Although the first unconventional gas well drilled into the Marcellus Shale in Pennsylvania was in Washington County, in the southwest where drilling activity has since regionally concentrated, it was the northern counties, and particularly Bradford, Tioga, Sullivan and Lycoming Counties in which shale gas development accelerated most rapidly at the onset of unconventional gas development. Figure Two shows the total number of unconventional gas wells drilled in the four counties on an annual basis from 2007 up through the end of October, 2014. These counties have also since experienced a noticeable slowdown and scaling back of industrial development as drilling activity has focused more in the southwest where “wet gas,” including butane and propane, has proved more profitable as global methane prices dropped.

Washington and Greene Counties, on the other hand, have experienced steady and more gradual expansion on gas drilling. While Washington and Greene Counties which are located between the metropolitan areas of Pittsburgh just to the north, and Morgantown, West Virginia to the south, in the northern counties with intensive development activity, the largest urban area with close proximity is Williamsport with a population of about 30,000. The surrounding areas are very rural with small towns and limited housing stock.

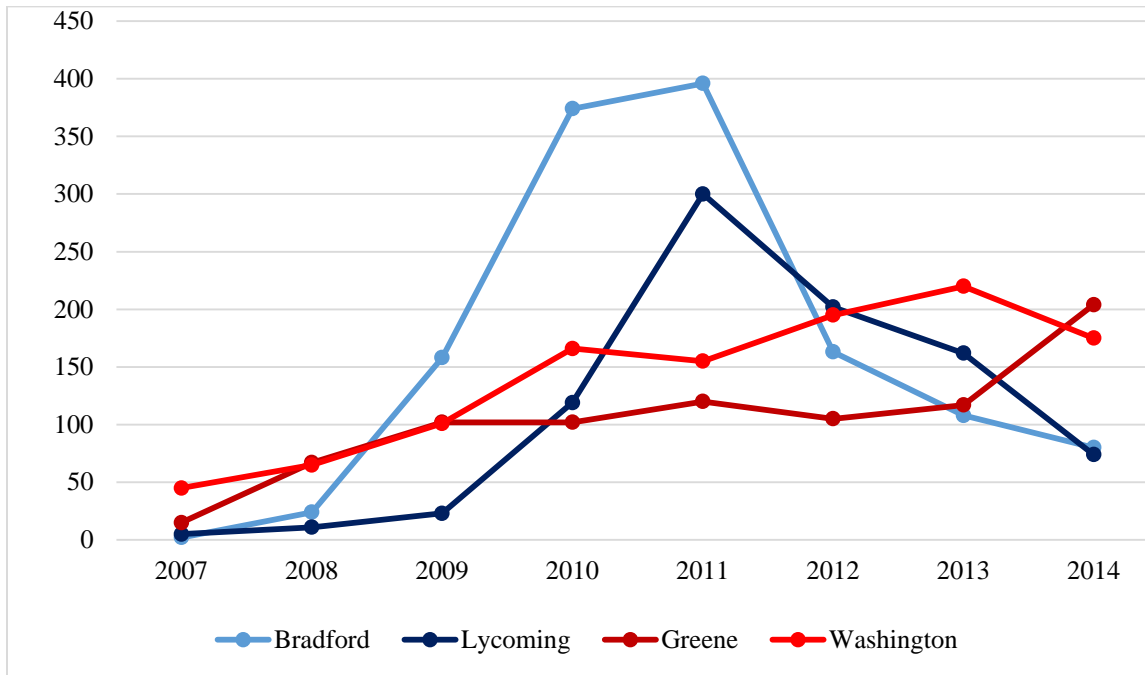


Figure 2. Unconventional gas wells by year, 2007-2014: Bradford, Lycoming, Greene and Washington Counties. Data obtained through Pennsylvania Department of Environmental Protection online reporting service. 2014 data through October only.

The local impacts of gas drilling have thus have played out somewhat differently in both of these regions. In the northeast counties the initial boom was more pronounced, a combination of the speed of the initial development, and the impacts on the more limited housing markets and social infrastructure including social services and law enforcement. In these counties housing was additionally negatively impacted by flooding which occurred in mid-2011 (Williamson & Kolb, 2011), for which federal disaster relief was secured for Bradford, Lycoming, Sullivan, Tioga, and Wyoming Counties because of the damage to housing and infrastructure. In the southwest, the local impact of the gas industry was less sudden and the larger housing markets in the suburban areas of Pittsburgh were somewhat more able to absorb new housing demands, although like the northeast counties, housing and particularly rental prices spiked dramatically in the southwest as well.

All four counties are relatively high poverty counties, although exurban Washington County, the closest in proximity to Pittsburgh, has not experienced poverty rates as high as the

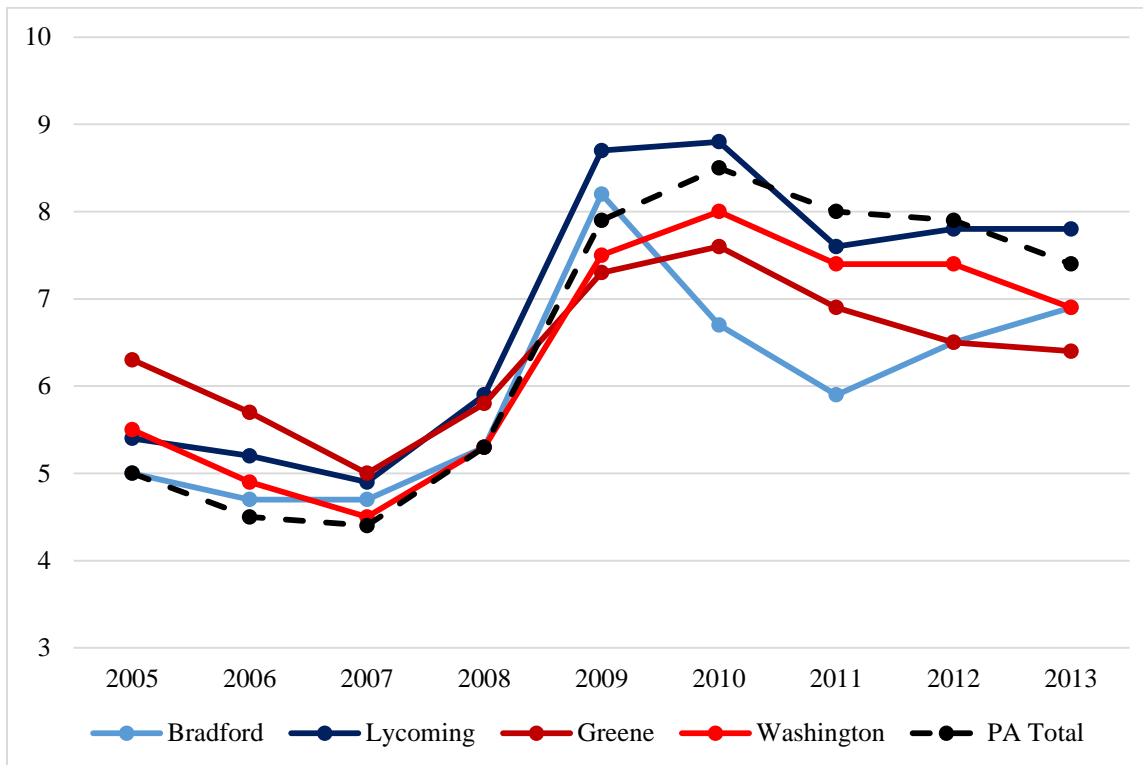
other three counties. Table One (next page) shows that in both 2010 and 2012 all four counties had poverty rates at or higher than the state poverty rate. The same is true of child poverty rates, with the exception of Washington County which had lower than average percentages of children in poverty. Of note is that while state poverty rates jumped between 2000 and 2012, for the most part they also increased in shale gas counties, with the exception of Greene County whose overall poverty rate decreased by one-tenth of one percent during the time period. In short, it is difficult to detect any mitigating effect that shale gas development may or may not have had on aggregate poverty levels during the time period.

Table 1. Poverty and Child Poverty Rates, Pennsylvania and Selected Counties, 2000, 2012

	Pct. Below Poverty		Pct. Children Below Poverty	
	2000	2012	2000	2012
Northeast Counties				
Bradford	11.8	15.1	15.7	20.7
Lycoming	11.5	13.7	15.1	20.0
Southwest Counties				
Washington	9.8	10.8	13.4	15.9
Greene	15.9	15.8	22.3	23.1
Pennsylvania Total	11.0	13.7	14.3	19.6

Data Source: Census Bureau Small Area Income and Poverty Estimates; Census 2000 Sample Demographic Profiles, Table DP-3; Census 2000 Summary File 3.

Figure Three (next page) shows unemployment rates at the state level as well as within the four counties. The effects of the Great Recession from 2007 to 2009 are reflected in both statewide and county level surges in unemployment, although the southwest counties, Greene and Washington show unemployment rates consistently below statewide levels after 2008 and consistently, if gradually dropping from that point to the present. On the other hand, in the northeast, Bradford and Lycoming Counties maintained higher than state average unemployment rates until 2009 in the case of Bradford County and 2010 in Lycoming County. Further, each of these counties has seen increases in unemployment rates beginning in 2011, coincident with the sharp reduction in drilling activity in those two counties (as seen in Figure One). Nonetheless, state data also show that counties with significant drilling activity saw job creation that neighboring counties with no or little drilling did not experience. This was particularly the case in particular sectors, notably mining, construction, transportation and food services. In Washington and Greene Counties between 2007 and 2011 total employment increased by 6.7 and 9.5 percent, respectively. While data were not available for Greene County, Washington County experienced nearly a 140% increase in mining sector employment. Bradford experienced a 315% increase, and Lycoming County experienced over a 1,000% increase in mining sector employment, although these percentages to some extent reflect low base levels of employment within that sector (Kelsey et al. 2014).



Source: PA Department of Labor and Industry

Figure 3. Annual unemployment rate for Pennsylvania and selected counties, 2005-2013

The Uneven Opportunity Structures of the Marcellus Shale Boom and the Creation of New Insecurities

As shale gas development came into these counties, especially in areas in which economic opportunities had long been lagging³, the expectation was that the new industry would bring a much needed economic stimulus. As local residents and economic data suggested, it *did* bring new opportunities, but the opportunities were not evenly distributed. Perhaps most dramatic were the windfalls that came from land leasing in which residents who held large tracts of land were able to lease to gas companies for sometimes many thousands of dollars per acre, including signing bonuses and royalties on gas from the wells (Brasier et al., 2011). Many farmers who had wondered how they were going to hold onto their farms, suddenly found themselves in completely different economic circumstances and not only able to pay off outstanding debts but able to purchase new equipment, which in turn provided unanticipated revenues to agricultural businesses and equipment dealers (although many also expressed concerns about the potential longer term social, environmental and economic impacts of the gas industry on their communities). Leasing, however, came at the cost of local disruption to roads

³ Conducting fieldwork for a project in Bradford County in the mid-2000s well before the shale gas boom, I was told by a rural school district superintendent, “my job is to provide people with the skills and knowledge they need to leave this area and be successful elsewhere, because there is nothing for them here” (Schafft & Biddle, 2014, p. 671). It would have been very difficult to imagine the same statement being made at the height of the boom in Bradford County.

and land, and at the risk of environmental disruption from pipeline development, well pad construction, and contamination of both surface and ground water (Glenna, Babbie, Kelsey, & DeLessio-Parson, 2014). Many of these costs and risks were additionally spread to those unable (or unwilling) to lease land.

Other beneficiaries of the gas boom included younger residents with the skills, experience and qualifications to take advantage of new, and often highly-paid, employment opportunities associated with the well pad and pipeline construction, drilling, and heavy equipment and vehicle operations. Local residents with commercial driver's licenses (CDLs) or with welding experience and certifications, for example, were well positioned to take advantage of new job opportunities, although many saw jobs taken by experienced oil and gas workers from out of state. As a Greene County resident related to us, "I think a lot of people took it for granted that somebody was just gonna knock on their door and say, 'Hey, come on. We're gonna go work at the gas well.' Honestly, I think that expectation was just devastating when they really realized they'd started seein' out-of-state people coming, starting the industry up, and didn't seem like they went away."

Additionally, gas industry jobs seemed to many locals bifurcated along gendered lines (Cusick, 2014; Schafft & Biddle, forthcoming; c.f. Filteau, 2014). While "man camps" were built to address housing shortages and provide housing for male workers employed on drilling rigs, women, if they tried to get work within the industry, found themselves mostly doing office clerical work or working as flag wavers. An economically struggling Bradford County woman (and, for a brief time, an employee at a well pad site as well) told us emphatically, "As far as fracking goes, as far as oil wells goes, it's very much a man's world...if you're 18 years old and you've just graduated from high school, or you're young, 21 year old and you're a male, you can get a job like that. I think if you're a female and you're very female and attractive to the guys, especially the bosses, you could get a job like that, maybe in the office⁴."

However, even among those positioned to potentially take advantage of new employment opportunities found themselves wary of both the demands of the work and its unpredictability. An educator in a school district in Bradford County related,

I mean there's still a lot of great jobs out there, and they're always looking for welders. So these kids, if they can go get certified to weld, they're gonna make more money than you and I are. But everybody I know that's doing stuff like that and even working, like this week they're working a hundred hours a week or 90 hours a week. Then you talk to 'em two months later, they're going in and sleeping two hours in the shop 'cause there's no

⁴ However, entrepreneur Amy Savage has gained media attention for founding an all-women owned and operated business in 2012, Oil and Gas Safety Supply (<http://www.oilandgassafetysupply.com>), which sells safety equipment to gas industry workers. Starting with an initial \$50,000, the business has since made over \$3 million in sales out of three storefronts in Ohio and western Pennsylvania. In contrast stands another start-up, Rigmaids, a cleaning and laundry service for gas workers founded in 2011, whose logo features a silhouette of a ponytailed woman dusting a drilling rig. "I thought we were maybe going to end up being four girls and two vans," the company's owner stated. "Now we're almost to 40 employees and 14 vans." Although Rigmaids hires men, most of the workers are women. "One of the men I hired quit. He said it wasn't his cup of tea" said the company's human resources person (Csebiniak, 2014, n.p.).

work, whether they're truck driving, water trucks. Whether they're welding or whether they're—it's like feast or famine all the time (Schafft & Biddle, 2014, p. 678).

Youth in heavily impacted shale gas communities often likewise expressed wariness about the industry.

I've noticed that a lot of people want to get into the drilling and things, but if you think about it, once they're done drilling here, you have to move. You have to go with them. You have to follow them if you're gonna probably stay with the company and get involved with it. So there are some people that have been like, oh, I'm gonna go to school to be a teacher so I can stay around here and teach or they're eventually gonna have to move away if they're getting involved with the drilling and the sites and the operations (Schafft & Biddle, forthcoming, n.p.).

Other employment opportunities were created as the gas industry moved into the county as new hotels and restaurants were built and new demands were created for service industries. But these jobs did not come close in pay to the jobs directly associated with the gas industry. Instead they paid minimum wage or slightly more, and were not commensurate with rising costs, and in particular the cost of housing. A man from Washington County stated,

I think it has created a lot of work, but it's created a lot of misery too. Yeah because your people are out here looking for houses every day and you're reading in the paper a 2-bedroom house for 1,200 dollars a month. Who can afford 1,200 dollars a month on an income of maybe 2,000 a month? That'll take your whole check by the time you pay your bills and everything else. That'll take your whole paycheck. And people wonder why we're coming to the food banks. What are we supposed to do? I get \$150 in food stamps. Do you think that's supposed to last me a whole month? I don't think so...I don't see it. They're just ruining the economy in my book. *They* might be benefitting from it. But *we're* not benefitting from it. The only thing we're benefitting from is going poor. Or being poorer. The rich might be richer and the poor get poorer.

We heard these kinds of observations from low income residents across the four counties with Marcellus Shale communities. A resident in Bradford County told us, “there's a lot of economic diversity where you've got farmers who are making \$2-3,000 a month on mineral rights ... and now have a lot of money to do stuff, compared to people that are struggling working at Dandy for \$7.00 (an hour)...full time jobs got so much (fewer), so you have a lot of part time jobs now. Instead of working one job you have to work three or four jobs just to survive.” This was echoed by a housing authority worker in Lycoming who said, “when they say there should be a job for everyone, that's not true. Not everyone's cut out to work for the gas industry. It's hard work. Not everyone is physically (able) or wants work the 60-hour weeks or whatever. It has helped the economy, there's more jobs but more low-paying jobs. Minimum income, minimum wage jobs. There's more restaurants that popped up than we know what to do with. More hotels that popped up than we actually need. They're all minimum wage jobs.” Still other residents talked about the time-demands of gas industry work, the frequent travel and the overtime that, while lucrative, was hardly family friendly. Others described the risks of working on the rigs, with several respondents mentioning a highly publicized accident in southern Greene

County in which a Greene County worker was incinerated in a gas well explosion⁵, which created further hesitations about the overall desirability of these jobs.

The experience of the shale gas boom for many then was that although certain types of economic opportunity and economic development were clearly occurring, these opportunities were very unevenly distributed. Many landowners found themselves the beneficiaries of unexpected fortunes from leasing and royalty revenue, but most people were not in a position to lease land. The high paying jobs that came into the counties were furthermore often directed towards workers from out of state already skilled within the gas industry, leaving Pennsylvania workers – and mostly men – to scramble to catch up. In the meantime, jobs were created in the service sectors to accommodate the influx of mostly out of state workers. But these service sector jobs were not high paying and people working within these jobs found it increasingly difficult to cover rising costs, a primary cost being rental housing.

Housing Demand and Housing Insecurity

Two things happened with regard to the demand for housing. The first was that with the influx of workers – often single men working long shifts – and especially in Greene, Lycoming and Bradford Counties where the existing stock of housing was limited, the demand for rental housing spiked as workers scrambled to find places to stay. Some of the gas companies built dormitories for the workers, but that by no means met the demand. The second was that the influx of workers were also being paid wages that in many areas were unprecedented. Landlords saw an opportunity for a windfall and rental prices in many instances doubled, tripled or even quadrupled. As a low income resident in Bradford County told us,

Now, these are guys—now, this is going 2008, 2009, cuz this is when we started noticing that the gas companies started coming in here. They were getting ready to build the man camp (for gas workers). Landlords started screening. If you're not a gas driller, we're not gonna rent to you. There was a few of them that were bold enough to say that. They figured, well, you know what? To make it easier to screen out those low-income who are dedicated to this county, than the fly-by-night gas drillers. Let's get what we can outta the gas drillers and 86 everyone else because, as opposed to me getting 800 a month, (going) to 2,500, 3,000 a month is a no-brainer, especially when you have someone coming in here, working three, four months, and then going out. The landlords, they figured, you know what? Why not make that dollar? Which, I guess, any owner like that, of a house or a complex, something like that, would want that.

A housing worker from Lycoming County similarly noted what she perceived as “gouging” on the part of landlords, and in particular gouging of those perceived to work in the

⁵ This incident was particularly notorious because the company that owned the rig, Chevron, responded in part by giving local residents over 100 certificates for free pizza and soda from a local pizza shop as a “token of appreciation.” “Worst apology ever: Sorry our fracking well exploded. Here's a free pizza,” one local resident posted on Twitter. See: <http://www.cnn.com/2014/02/18/us/chevron-pennsylvania-explosion-pizzas/> .

gas industry (although rising prices for rental and shrinking availability affected everyone looking for housing⁶).

I called a landlord—I saw an ad in the paper for an apartment. It was a one-bedroom apartment. When I called and said that I was with the gas company, now that one-bedroom apartment was \$1500.00 a month. When I called back a day later and said I was just looking, it was still high but it came down \$900.00. In reality, that apartment wasn't work \$500.00. That's just a sample. Can you blame it all on the Marcellus Shale? No. You have to look at the whole picture.

As the search for housing, and especially for those at the economic margins, became more desperate, schools began to see increasing incidence of homeless students. Because of the nature of the demographic change and the housing demand, homelessness within schools, oddly enough, took on some unexpected forms including what some educators referred to as the "Hummer homeless." What educators and administrators had observed in the school system was that although there was an influx of workers, this did not result in enrollment spikes because most workers arrived without children. Those who did arrive with children and/or a family faced the same housing shortage (although they typically had more financial resources). However, the children under federal guidelines were technically homeless because they were living in temporary, non-permanent housing (in this case, most typically mobile homes and RVs), but coming from households earning well over the poverty line and, as the apocryphal story goes, being driven to school in their parents' Humvee (Schafft et al., 2014). Others found themselves in far more dire circumstances.

In a Bradford County school district an elementary school principal stated, "I've been in education for thirty-five years (and) this is the first year I've ever known of some of my students being homeless. In fact, I have a family that they have been evicted and they have to be out today and they don't have anywhere to go" (Schafft, Glenna, Green, & Borlu, 2013, p. 399). In Greene County, similarly, an educator told us,

When the drillers came through, there was a wonderful market that blew up right away about getting rental properties. Landlords that had been able to get maybe a maximum of \$300.00 to \$600.00 for a trailer could now get as much as a \$1000.00 to \$1500.00 a month. That really, really restricted our market. Not only did we lose housing, we also took what was limited there and blew up the rental cost on it, which was really beneficial for a very small group of people, but for folks that are already impoverished and needing a place to stay, gone.

This same narrative was repeated to us over and over again as residents related how their housing circumstances became increasingly tenuous. In some cases, even residents who had been economically stable throughout their adult lives began to face new and unanticipated insecurities. A formerly homeless interviewee in Greene County related how after a divorce she

⁶ During our earlier fieldwork however we interviewed a recently hired school district superintendent who was living temporarily over an hour outside of the school district because he was unable to find local housing. That is, the housing crunch did not only affect low income residents.

had tried to return to college in order to gain more qualifications while at the same time supporting her children.

(From) 2008 to 2010 I'm in this house, and (the landlord) starts seein' this money, money, money comin' in to the area, and he's thinkin' now he needs to boot me out because he's only getting' \$400.00, that's all I can afford. He says, "I'd like to have more," and then come in here to pay the expenses, pay the taxes. Then, therefore, I say, "Okay, I'll look for another place." I'm in college, working as much as I can work with the children. Then I'm out there looking for rent. All a sudden the gas starts comin' into this area, 2011, early 2011. It's startin' to grow a boom in this area. People are sayin' rent is between \$800.00 and \$900.00. How can you afford this being a single parent with three children? Technically three, because she was at college, but she would come home. I just couldn't do it.

All this was middle of March. He calls up and says, "Since you won't get out I'm going to sell the place. I have a buyer from the pipeline company"—Atlas, I think it was at the time—"who wants to buy my house and he wants to pay"—and this thing was only valued at \$68,000.00. You can't say that it was very much of a house, but it was my home. He says, "The guy wants to give me \$189,000 cash to put his guys up into this house." Now you've just knocked a family out onto the streets. I had nowhere to go. I was homeless. There was no place to go. I couldn't afford those houses out there. What you could afford was cockroach infested places. I mean it was low living. I don't want my children there. I have always, just to put this into perspective, had my children either home schooled or private school, pay for private school, because I didn't want my children involved in what was in the area. I've always had a protection around them. Now I'm homeless and nowhere to go.

Although some respondents expressed anger at local landlords for rent increases beyond what many could afford, others saw it as part of the experience of economic boom in chronically depressed areas. As a Greene County man told us, "everybody wants to have hope, but there's nothin' really to inspire it with a lot of folks, especially in an area like this that is already depressed economically, so bring in a little bit of money to dangle in front of their face, and, of course, they're gonna live in the moment. Most of them will jump at whatever opportunity and jump through whatever hoops they have to to get to that point."

In the northern counties housing assistance agencies also quickly found that the fair market rental values couldn't keep up with the sudden rental cost spikes. Housing vouchers have to fall within "fair market rent" – a calculation based on data from several years prior. The Bradford and Tioga County Housing Office requested an exception, given the distortions in the housing market, and they were able to increase the vouchers to cover 125% of the fair market value of rents in the area, which still did not begin to cover the actual increase in most rental prices. Additionally, the office's overall budget for vouchers remained the same, meaning fewer families could receive vouchers. By 2014, fair market prices had finally caught up with current housing costs. Nonetheless, regional demand for Section 8 vouchers was so high that the housing office was forced to close the vouchers waitlist for the first time in 27 years. This means residents can no longer apply to be placed on a waitlist, let alone receive housing support. As of

fall, 2014, 594 people were on the waitlist in Bradford County, while the office only had funding for 203 households. While drilling activity has noticeably slowed in the northeast counties and consequently the pressure on housing markets has backed off, residents report more vacancies and dropping prices for rentals although residents also consistently report that prices for rentals have nowhere near returned to what they were before the boom began. In the Southwest, and in particular in highly rural Greene County, housing pressure has remained consistent and those without family and friendship networks have found themselves especially vulnerable to housing insecurity and sudden housing crises.

Conclusions

In Pennsylvania, unconventional gas extraction from the Marcellus Shale has been alternately lauded and decried. Advocates of shale gas development within Pennsylvania's Marcellus region have emphasized the windfall economic benefits of industrial development. In the meantime, they have simultaneously tended to frame local social and environmental risks "as mere factors in a broader marketplace of costs and benefits" (Finewood and Stroup 2012, p. 73; c.f. Malin 2013; Perry 2012; Poole and Hudgins 2013)⁷. Opponents of shale gas development in the meantime have principally emphasized unacceptable environmental risks and uncertainties. This bifurcation in the way that shale gas development has primarily been framed within public discourse misses the complexity of not only the ways in which shale gas development involves both significant opportunities and risks, but more importantly how those opportunities and risks are unevenly distributed across people, places and over time (Schafft, Borlu, & Glenna, 2013). Given the ways that boomtown development can paradoxically create new poverty, insecurity and inequality, the situated, specific economic circumstances of many residents in Pennsylvania's shale gas region reflect the broader on-going conflicts between the well-being of rural communities and local attempts at resilience and adaptation within the neoliberal logics of a globally integrated world economy that views rural and economically marginal areas as a periphery whose role is to provide human and material resources to an increasingly urbanized core (Bauman 1998; Corbett 2007; Finewood and Stroup 2012; Perry 2011; Schafft 2010).

A number of implications are suggested by this work, both theoretical and policy-oriented. First, the boomtown scholarship, in its focus on the stages of the boom-bust cycle, and the creation of economic insecurity in the bust, has largely missed the ways in which uneven structures of opportunity – and uneven exposures to risk – create new poverty and insecurity as a consequence of rapid economic expansion and development. More attention needs to be paid to the uneven consequences of boomtown development across all stages of the boom-bust cycle, and particularly the ways in which existing inequality and insecurity can be dramatically exacerbated in the midst of economic boom where "anyone who wants to find a job can find one." Further, scholars and policy makers would do well to recognize the kinds of "mini-booms and busts" that can occur and how these fluctuations affect the well-being of local people and

⁷ Terry Engelder, a Penn State University Professor of Geosciences, often receives partial credit for the Marcellus boom because of his work showing the gas extraction potential in the Marcellus Shale Play (Engelder, 2009; Wilber, 2012). Regarding shale gas development, Engelder has stated he has "an unabiding faith in America's industry to get it right" and, referencing John F. Kennedy, within a public forum he once described the well water contamination in Dimock, Pennsylvania and elsewhere as a "necessary sacrifice" for the sake of natural gas extraction and the technological development of the industry (Engelder, 2011). Several residents of Dimmock and other shale gas communities in attendance at the event, quickly made it known that they did not share his opinion.

communities. While the counties in northeastern Pennsylvania like Bradford, Lycoming, Tioga and Sullivan are far from seeing the end of shale gas development, the trajectory of industrial activity has followed a very different path in those counties than from their counterparts in the southeast (see Figure 2).

Secondly, the boomtown literature rarely considers the spatiality of boomtown development and how differing spatial and institutional contexts may affect social and economic outcomes for individuals and communities. Although this paper has only touched on this subject, the four counties provide compelling contrasts with regard to density of population, housing markets, physical infrastructure and legacies of natural resource extraction. All of these contexts affect the social and economic impacts of rapid natural resource development and the ability of individuals and communities to adapt, adjust and respond. What are the consequences for those at the economic margins in these places? Another way of thinking about the spatiality of boomtown development is considering how the concentration of drilling activity has been highly variable with some areas experiencing intense drilling activity and other areas experiencing very light activity and a less sudden onset of industrialization. This enables approaches that use space to think about boomtown development and its impacts as a *cross-sectional* rather than longitudinal variable (i.e. the variation in development levels at one time over space as opposed to the variation over time with regard to the boom- bust cycle). Relatedly, how are peripheral areas affected differentially? For example do displaced residents priced out of rental housing find themselves moving to adjacent counties and if so what are the impacts there?

Pennsylvania, under the leadership of two governors has aggressively pushed shale gas development. Under Tom Corbett's administration in particular⁸, state policies have been heavily pro-industry under the neoliberal assumption that development of the Marcellus Shale will create critical economic growth, and particularly in areas of the state that have long lagged behind in job creation. While there is no question that economic development has occurred, what has been largely overlooked are the ways in which many of Pennsylvania's most vulnerable residents have not only been largely excluded from the creation of new economic opportunities, but how they have also been most immediately exposed to new insecurities – in particular housing market distortions and the inability to meet rising costs of living. Poverty generation in the midst of economic boom conditions represents yet one more way in which poverty in America – and in particular rural poverty – is largely invisible, a circumstance that, fifty years since the initiation of the War on Poverty, is still very much with us (Fitchen, 1981; Shucksmith & Schafft, 2012).

⁸ On November 2nd 2014 Corbett failed to become re-elected for a second term, the first time this has happened since, in 1970, Pennsylvania allowed governors to serve two consecutive terms. Corbett had steadfastly refused to impose a severance tax on natural gas. Governor-elect Tom Wolf has promised to instate a severance tax.

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