



Lampkin, Jack ORCID logoORCID: <https://orcid.org/0000-0001-5104-8758> (2020) The uncertainty of community financial incentives for 'fracking'. In: South, Nigel and Brisman, Avi, (eds.) The Routledge International Handbook of Green Criminology. 2 ed. Oxon, Routledge, pp. 481-494

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<https://www.routledge.com/Routledge-International-Handbook-of-Green-Criminology/South-Brisman-Brisman-South/p/book/9781138633803>

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The Uncertainty of Community Financial Incentives for ‘Fracking’: Pursuing Ramifications for Environmental Justice

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Introduction

This chapter aims to do two things. Firstly, whilst there is a recognition that green criminological research is important, there is a corresponding realization that there is a lack of green criminological research that focuses specifically on *energy crime* (and energy harm). This is despite an appreciation that many energy extraction processes create environmental harm and ecological destruction. In order to contribute to green criminological literature on energy crime, this chapter explores the emergence of *unconventional hydraulic fracturing*¹ (UHF) in the United Kingdom (UK) with a concurrent discussion of the global academic literature that has identified both social and environmental harm as a result of such technology overseas. Secondly, there is an analysis of the *community financial incentives* (CFI's) that are provided to “communities” in respect of the right to use underlying geology for the purposes of UHF and the pursuing ramifications that such payments may have for environmental justice in the communities that host fracking. The chapter draws on empirical research (interviews) conducted with key-informants. As a result, the two central purposes of this chapter are:

1. To underline the lack of research on energy crimes (and energy harms) within green criminological discourse despite the global nature of ensuing environmental harm from such activities; and
2. To highlight the ramifications that CFI's have for environmental justice in the communities that host UHF in the UK.

Research Rationale and Methodology

This chapter draws upon interviews that were collated by the author as part of an empirical, qualitative, PhD project investigating the potential for economic and environmental victimizations to occur as a result of UHF processes in the UK. Prior to the commencement of interviews, the researcher conducted a literature review which identified 12 central areas where victimization may occur. These included, the potential economic impacts of UHF on: jobs, property value, energy security, the economy and community financial incentives, as well as the potential environmental impacts of UHF on: water resources, water aquifers, produced water, seismicity, well integrity, chemical usage, and greenhouse gas emissions. As a result, the following research questions were formulated:

1. What do key informants understand to be the most salient concerns regarding human victimization in the UK?
2. What do key informants understand to be the most salient concerns regarding environmental victimization in the UK?
3. What do key informants understand to be the economic implications of unconventional hydraulic fracturing in the UK?

In terms of conducting the research, 20 interviews were conducted between May 2016 and September 2017 with key-informants to the UK onshore oil and gas industry. Key-informants are simply defined as *expert sources of information*, people who ‘as a result of their personal skills, or position within a society, are able to provide more information and a deeper insight into what is going on around them’ (Marshall, 1996: 92). Participants consisted of; three academics, four consultants to the onshore oil and gas industry (geology and water), three

regulators, two parish councillors, one journalist, five anti-fracking campaigners, one oil and gas professional, and one gas company director.

The chapter will now take the following course. Firstly, there will be an explanation of the importance of green criminology as a discipline. Secondly, there will be explanation of the current lack of green criminological research into energy crime (and energy harm) despite the local and global impacts that energy production and consumption have on the environment and social and ecological justice. Thirdly, there will be an examination of the emergence of UHF in the UK specifically, followed by an investigation into the social and environmental harms that have occurred from UHF internationally, based on existing academic research. Finally, the chapter will draw upon empirical data to explain the implications that community financial incentives have on environmental justice in the UK.

The Importance of Green Criminological Research into Energy Extraction Processes

Environmental issues laid mostly dormant within criminological discourse until Lynch's (1990) establishment of a *green* criminology. Consequently, since the late 1990's, the green criminological volcano has erupted to produce a body of research that encompasses a wide-range of themes and topics that are encapsulated under the green criminological perspective (whilst there is not enough room here to identify them all, some seminal green criminological texts include: Beirne and South, 2013; Halsey and White, 1998; Halsey, 2004; South, 1998; South and Brisman, 2013; Stretesky et al. 2014; White, 2012; Walters et al. 2013). Despite green criminology therefore being a growing area of criminological research (Brisman and South, 2013: 2; Ruggiero and South, 2010a: 252; Shearing, 2015: 259) there has been hardly any academic green criminological analysis of energy extraction methods despite a recognition that energy extraction processes do often lead to social and

environmental harm (a few notable texts do exist such as: Greife and Stretesky, 2013; Lampkin, 2016; Long et al. 2012; Ospal and Shelley, 2014; Ruggiero and South, 2010b; Short, In press; Short and Szolucha, In press; Stretesky et al. 2014; White, 2013). Critically analysing energy extraction is exceedingly important in an era where many conventional fossil fuel resources have already been exploited, leaving corporations to search, identify and later exploit, more unconventional (and essentially more difficult to extract) fossil fuel resources which is fuelled by a global increasing demand for energy.

Energy is deemed by neo-liberal society to be an indispensable and necessary component to modern civilisation. Energy creation not only satisfies the consumption lust of modern western culture, but is the fuel that drives the multiplicity of industries and corporations that keep the *treadmill of production* (ToP) running. As Stretesky et al. (2014: 49-50) note: ‘fossil fuels are important energy sources; when burned, they release large quantities of energy. Nevertheless, the withdrawal of fossil fuels causes significant ecological disorganization and ecological destruction’.

And the treadmill is running exponentially faster. The capitalist system requires more and more energy in order to continually satisfy economic imperatives, such as economic growth and job creation. But capitalism would require infinite resources and infinite economic growth in order to continue to be successful and to enjoy the same profiteering that has occurred post-World War II. Whilst the earth is capable of supplying humans with seemingly infinite renewable energies (i.e. wind, sun, water) such usage is currently heavily outweighed by anthropocentric obsessions with non-renewable resources (i.e. oil, gas, coal). According to Jefferson (2015: 8) ‘around 80% of the World’s current energy supply comes from fossil fuels... coal accounts for about 29% of the total; oil for about 31%; and natural gas for about 21%’. The situation is exacerbated by the recent exponential increase in the global human population. In the past 50 years, the world population has doubled (to 7.5

billion), and world energy consumption has tripled (Global Energy Research Network Institute, 2011: 32). Similarly, and looking ahead to the future, the global human population is set to rise to 9 billion by 2050 and to 12 billion by 2100 (Jefferson, 2015: 7). Simply put, more energy will need to be supplied in order to provide enough energy to sustain everyone. If supply is unable to cater for such an increasing demand, the numbers of humans unable to access energy will increase. Although access to energy is not the scope of this chapter, it presents an interesting avenue of research for those green criminologists investigating energy crime or environmental justice issues.

An increasing energy demand for a growing global population raises pertinent practical and philosophical questions as to how humans can bridge the environment – energy nexus and perform an ecological balancing act. As of 2014, only 14.2% of the global supply of energy was produced from renewable energy sources (O’Sullivan et al. 2017: 5). Although this is predicted to rise to 19.3% by 2040 (O’Sullivan et al. 2017: 5) the rise in global human populations means energy demand will outweigh energy supply, particularly of (non-renewable) fossil fuels resources. One method for increasing the longevity of fossil fuel supply is to turn to more unconventional forms of fossil fuel energy extraction. However, whilst unconventional methods may help extend the timeframe of human use of fossil fuels, such energy extraction methods are associated with higher levels of social and environmental harm than conventional energy extraction methodologies (see Carrara and Massetti, 2014). Some authors now are now referring to such unconventional energy extraction as processes of *extreme energy* (Short and Szolucha, In press), the extensive environmental and social harms from which can be seen to constitute a form of ecocide (Short, In press).

Despite this, several nations, including the United Kingdom (UK) are exploring unconventional energy generation options. The most recent of these options is the method of unconventional hydraulic fracturing (UHF) which is an engineering procedure that can be

used to extract natural gas that exists in deep, impermeable shale reservoirs and combines conventional vertical drilling with unconventional horizontal drilling.

In order to conduct such drilling activities, fracking companies are required to make payments to communities in respect of such activities (Great Britain. *Infrastructure Act 2015*). This chapter will undertake a critical analysis of such payments by analysing qualitative interview data from *key-informants*; people who are involved with, or are knowledgeable about, fracking in the UK. Firstly, however, there will be a discussion of the emergence of UHF in both a global and national sense followed by the extent to which fracking may produce both social and environmental harms.

The Emergence of Unconventional Hydraulic Fracturing in the UK

The UK has long relied on traditional fossil fuel energies such as oil and gas to provide UK industry and consumers with an expendable energy supply. In the post-World War II era, this supply has come from a mixture of North Sea oil and gas, conventional onshore oil and gas production, and the importation of oil and gas from various energy-abundant nations around the globe (either pipelined or in the form of Liquefied Natural Gas). However, with North Sea oil and gas exploration and production in steady decline (Mair et al. 2012: 18; Rogers, 2013: 8), new ways of producing consistent, consumable energy are required in order to satisfy the current consumption demands of individuals and corporations in the UK (to avoid amplified reliance on fossil fuel importation).

Unconventional hydraulic fracturing is one technique, at least in the short-term, that may go some way in satisfying such an energy void, and the term ‘unconventional’ can, in this context, mean two entirely different things. Firstly, unconventional can refer to the *type of resource* that the method of UHF is being applied to. Conventional oil and gas production

targets permeable reservoirs (Speight, 2013: 1), locations where the hydrocarbons are the easiest to extract such as sandstone and limestone, which are relatively porous (Prud'homme, 2014: 26). However, unconventional oil and gas production targets more impermeable formations (such as deep shale reservoirs). Yet, because of the low-permeability of shale (i.e. substances do not flow well), the rock needs to be stimulated in order to generate a flow, which leads to the second meaning of the term “unconventional”. Unconventional, may refer to the specifically unconventional *technology* that is applied in the production of deep shale gas reservoirs. In conventional oil and gas production, wells are drilled only vertically and, consequently, only access a comparatively small pocket of hydrocarbon resource. In unconventional oil and gas production, the wells are drilled vertically (as with conventional drilling), but the drill-bit is gradually manoeuvred to a horizontal direction which enables the well to continue to be drilled through the target (shale) formation (Speight, 2013: 73). This enables much more oil or gas to be extracted as more resource is exposed and the formation can be hydraulically fractured multiple times (Stephenson, 2015: 64). For the remainder of this chapter, the term UHF and “fracking” more colloquially, will refer to a combination of both of these meanings.

It is important to note that UHF is not the only way of producing a consistent supply of consumable energy. Although there are some issues with storage capacity, renewable energy has the potential to provide the UK with a cleaner, greener, energy supply through a multiplicity of technologies such as: on-shore wind, off-shore wind, wave, tidal stream and solar PV (Carbon Trust, 2003). Conversely, there are also other less attractive technologies (in a moral, social, economic and environmental sense) such as nuclear power, and the increased importation of traditional oil and gas resources from overseas. However, despite these options, the UK government is attempting to implement a shale gas industry, where UHF is legally permitted, subject to a series of licenses, planning permission's and

environmental and health and safety permits. Such implementation is continuing despite a lack of public acceptance of such technology (Department for Business, Energy & Industrial Strategy (DBEIS), 2017)² and the recognition that UHF can often create significant social and environmental harms (for example, see: Jackson et al. 2013; Jackson et al. 2014; Mooney, 2011) which will now be analysed further.

Fracking – Social and Environmental Harm

Social Harms

There is a growing body of evidence that suggests UHF has created multiple instances of both social and environmental harms in the areas where UHF has occurred (which largely includes: Australia, South Africa, Poland, Canada, the UK, and some US states). Whilst this chapter concentrates on the economic implications of fracking in the UK, it is important to recognize some of the research that identifies such social and environmental harm, as this is extremely significant in highlighting the purpose and importance of a green criminology. Whilst, UHF creates social and environmental harm, traditional criminological approaches are not well-positioned to examine such harm as orthodox criminology is based on the preconception that, if something is defined as legal, then no harm is taking place. As Stretesky et al. (2014: 3) note:

‘there is a false assumption that if environmental damage is not defined as criminal, no serious harm is occurring. This idea is reinforced within criminology by the orthodox definition of crime as a violation of the criminal law, which excludes environmental crimes since these acts are often defined as violations of other, non-criminal forms of law’.

So, what are the social and environmental harms that are associated with fracking?

There are several official reports which directly address the potential impact of fracking on public health (see, for example: Harrison et al. 2014; McCoy and Saunders, 2015; Public Health England, 2014) as well as a body of organizational and academic research sharing similar concerns (see, for example: Buck, 2015; Colborn et al. 2011; Down et al. 2013; McKenzie et al. 2012; Rabinowitz et al. 2015; Warhurst and Reap, 2015). The potential impacts on public health will depend on a variety of geological, demographic and economic factors and it is therefore not possible to say exactly what the harms will be prior to conducting UHF. However, following a precautionary principle (and after learning from the harms that have already occurred as a result of UHF overseas), it is appropriate to debate and analyse what harms may occur before such operations take place. Although public health impacts are manifold and complex, a common and, arguably the most obvious, impact comes in the form of air pollution. Srebotnjak (2014: 4-5), for example, cites a plethora of research on air pollution which concerns; diesel emissions from heavy trucks and machinery; toxic air pollutants originating ‘from direct and fugitive emissions of hydrocarbons at the wells and from associated infrastructure’ (Srebotnjak, 2014: 4); as well as hazards from silica sand and ozone smog (Srebotnjak, 2014: 4-5). As well as this, there are other pollutions that are directly associated with the construction and development of a wellsite such as ‘traffic, dust, noise, odours, un-natural light and other nuisances’ (McCoy and Saunders, 2015: 16).

Alongside the detrimental impact of fracking on human health, another major social harm is evident in the concentrated truck traffic that is a necessary component to UHF. The very essence of unconventional hydraulic fracturing (using fluid to hydraulically split open impermeable shale rock) requires fluid (a mixture of water, sand and chemicals) to be brought to wellsites via trucks to service wells. Later, when some of this “flacfluid” returns to the surface of the well as wastewater, more trucks are required to transport the fluid to the

relevant storage unit or wastewater treatment facility. Trucks are also required in the construction and de-construction of wellsites themselves. As McCoy and Saunders (2015: 16) note:

‘The amount of truck-heavy traffic required to build the wellpad and its surrounding infrastructure (e.g. offices, generators, compressors and tanks), drill the boreholes, and transport fluid, silica and various other materials is considerable. Estimates of the amount of traffic involved vary, with the critical factors being: the number of boreholes; whether water is piped or trucked in; and the volume of flowback needing to be transported away. The Institution of Civil Engineers estimated that a single well might require between 500 and 1,250 HGV lorry movements. The Royal Society for the Protection of Birds estimated a figure of between 4,300 and 6,600 truck trips per well pad. If a well pad were to generate as many as 40 boreholes, the number of truck movements could be of the order of 34,000 movements on and off a pad (over the typical two-year lifetime of a well, but with a concentrated period of about six months)’.

Such intense truck traffic has implications not only for human health by the way of air pollution from diesel fumes which may affect local air quality, but will have a considerable impact on the enjoyment of one’s property. When discussing air quality issues in relation to human rights, Short et al. (2015: 712) explain that ‘when the rights to privacy, family, home and protection of property are read to include pollution... it is apparent that the effects of fracking on the land are capable of legally violating human rights’.

Alongside the ability of fracking to generating social harms, and critical to the study of green criminology, is the ability of fracking to produce environmental harms.

Environmental Harms

Although there is a common miss-conception that fracking-induced fissures will provide a pathway for fracfluid to migrate upwards from deep underground into shallow water aquifers or other drinking water stores, fracking does have the potential to contaminate groundwater and surface water. Accidental spillages may occur either onsite (during handling, mixing, or wastewater treatment), or during fluid transportation (due to truck intensity) (Warhurst and Buck, 2015). Contamination may also occur from well-integrity failure ‘whereby some part of the well becomes damaged or degrades over time, opening up a potential contaminant pathway’ (Harrison et al. 2014: 5). These problems can lead to water contamination which is well documented in the US (for collated evidence see: Harrison et al. 2014: 5; Jackson et al. 2014: 337-340; for direct evidence, see, for example: Jackson et al. 2013; Osborn et al. 2011).

Fracking also increases seismicity (Jackson et al. 2014). Whilst the UK is not prone to large earthquakes, fracking may produce micro-seismicity of the magnitude that enables damage to property (Short et al. 2015: 711). Whilst it is unlikely that seismicity will cause any threat to life in the UK, there are explicit moral and philosophical concerns over many issues relating to fracking such as water extraction, water contamination, air pollution, land contamination and induced seismic events. Green criminology has scarcely interacted with philosophical debates over environmental harm (exceptions include: Halsey and White, 1998; Lampkin, 2016; White, 2012; Wyatt, 2013: 60-65) despite the obvious juxtaposition that legal acts may often create environmental harm or contribute to ecological destruction. There are clearly philosophical and jurisprudential discussions to be had surrounding the relationship between the law, morality and environmental harm (particularly where energy creation is concerned). Although there are some discussions taking place in the disciplines of environmental law (namely earth jurisprudence. See: Burdon, 2011 for more detail) and

ethics (see: Sagoff, 2008; Weiss, 1990;), green criminology is well positioned as a far-reaching discipline that considers all instances of environmental harm and social injustice (regardless of whether harm leads to the violation of criminal laws), to contribute to such discussions.

Corporate, governmental and oil and gas industry support and sponsorship for UHF technology is based on the philosophical premise that such development will be economically beneficial for the UK. For example, several reports have alluded to the positive impact that shale gas production could have on: jobs (Institute of Directors, 2013; Onshore Oil and Gas Industry, 2014), energy security (Delebarre et al. 2017; Tovey, no date – in the long-term), balancing job losses that are accruing from dwindling North Sea oil and gas production (Mair et al. 2012: 18; Rogers, 2013: 8) as well as local community benefits from community payments (Delebarre et al. 2017). Whilst it is not possible to discuss all of these, the remainder of the chapter will examine the final economic justification (the impact of community payments on local communities) and – in the true spirit of green criminology – will unearth serious environmental justice problems inherent with such a payment scheme.

Community Financial Incentives (CFI's): Legal Requirement, Corporate Good-Will, or Financial Bribery?

With respect to onshore energy generation, it is common-place for communities to receive financial incentives in respect of operations carried out for energy generation purposes. Payments are incentives for communities to accept such development which may result in some short-term disturbance, or longer-term visual impairment – for example. An illustration of this can be found in the onshore wind sector, where communities can benefit from the financial investment that comes with hosting such a development via; community

benefit funds (voluntary payments from the onshore wind developer), benefits in-kind (other one-off voluntary benefits, for example, on energy discount schemes), community investment or shared ownership (the community has a financial stake in the scheme), socio-economic benefits (from jobs, skills training, apprenticeships etc.) and material benefits (steps taken to improve infrastructure for example) (Department of Energy and Climate Change (DECC), 2014a: 8).

The production of sub-surface hydrocarbons onshore is no exception to such a situation. In February 2015, the UK government passed the *Infrastructure Act 2015* (Great Britain. *Infrastructure Act 2015*) which required “relevant energy undertakings” (i.e. fracking ‘companies’ or fracking ‘operators’) to make payments to “owners of relevant land” or “interests in relevant land”, “for the benefit of areas in which relevant land is situated”. This essentially insinuated that operators must make payment to individuals or communities in respect of the right to use land, from which it is then possible to drill to access sub-surface hydrocarbons (subject to regulations by the Secretary of State):

‘45 Payment Scheme

(1) The Secretary of State may, by regulations, require relevant energy undertakings to make payments in respect of the proposed exercise, or exercise, of the right of use.

(2) The regulations may require payments to be made—

(a) to owners of relevant land or interests in relevant land;

(b) to other persons for the benefit of areas in which relevant land is situated.

(3) The regulations may—

(a) specify the amount or amounts of payments;

(b) make provision for determining the amount or amounts of payments.

(4) The regulations may require relevant energy undertakings to provide the Secretary of State, or any other specified person, with specified information about—

(a) the proposed exercise, or exercise, of the right of use;

(b) the making of payments in accordance with regulations under this section.

(5) Before making any regulations under this section, the Secretary of State must consult such persons as the Secretary of State considers appropriate' (Great Britain. *Infrastructure Act 2015*).

With regards to the regulations that concern the payment of such CFI's, the DECC (2014b) reported that:

'In its Community Engagement Charter, the UKOOG³ committed to a community benefits package. The operator will:

- at exploration/testing stage, provide £100,000 in community benefits per well-site where fracturing takes place

- at production, pay 1% of revenues to communities' (For a critique, see: Cotton, 2017).

If UHF is to take place onshore in the UK, it is arguable that it makes financial sense that communities should accept financial payments:

"it would seem very sensible to consider at least how a local community is impacted and whether there are financial aspects that can mitigate against any impact"

(Primary Research: Academic Geologist).

However, there are numerous concerns surrounding such community financial incentives such as; the extent to which payments can be considered to represent corporate financial bribery; whether one-off grants actually distort community projects in the long-term; problems with defining who and what constitutes the *community*; and the problematic

relationship between CFI's and local economic loss. These issues will now be debated in turn, with further reference to primary research.

During the research, several interviewees expressed the view that CFI's represent corporate financial bribery. Essentially, providing a monetary sum can be viewed as a financial exchange for the ability to conduct operations which result in environmental and social harm. Such payments are neither a 'win' for the environment which may incur harm or contamination, nor a 'win' for people living within communities who are subjected to disturbances in their community (for example; noise, traffic, dust, infrastructure damage). The following extracts represent such a view that CFI's represent a form of "bribe", "blood money", or "admission(s) of guilt":

"And you know there are some quite interesting quotes in the papers that came immediately after the Third Energy application where there were people saying this is blood money you know we wouldn't accept it, er, we don't want it" (Primary Research: Journalist).

"I think it needs to be made clear where it is going to go so that people know more about it and are more inclined to agree to it. Um, I know some people would see it as a bribe as well, because again, that's happened in North Yorkshire" (Primary Research: Consultant Geologist).

"I think it's very cynical, um, and it's also an admission of guilt really, an admission that fracking will have a very negative effect and so people need to be bribed. I don't actually think that that's working" (Primary Research: Anti-Fracking Campaigner).

Although £100,000 may on first-glance appear to be a large sum of money that may go a long way in providing vital finances for local communities, such a one-off grant may actually distort the ability of local communities to provide essential goods and services in the long-term. For instance, whilst £100,000 may help to build a community centre, or provide a bus

for a local bus service, many services (transport, youth services for example) require more long-term financial commitment in order to keep such services running. Such a situation can be seen in the following excerpt:

"if it's a one-off grant of £100,000, that is useless, local authorities run services and services require revenue costs. Ok you need new buses you need a bus replacement programme but you need the money to run the service, day in day out year in year out, and a one-off grant just distorts that. £100,000 I think would buy you 1 and a half buses? Possibly? It's useless. Youth service the same. You can't just switch on a youth service for a year" (Primary Research: Anti-Fracking Activist).

Although there is a corresponding commitment of 1% of revenues being provided to local communities which may play a role in providing long-term solutions to the ability of communities to provide services, there is no indication as to exactly how much 1% is in monetary terms. This 1% depends entirely on the success of each particular site which is unknown until shale gas is being produced. 1% could turn out to be a significant amount of money, but could equally turn out to be worthless if the wellsite turns out to be uneconomical:

"No way is it enough and neither is the fact that they will give 1% of the revenue to the community. Um, because it is a carrot that they dangle but they can't define or quantify what that is. It could be a lot of money. It could be nothing at all. So, I always look at it as compensation" (Primary Research: Local Parish Councillor).

Additionally, significant problems arise from the failure of the UK government and industry to define what it means by *community* to which the CFI's are to be paid. Unlike official guidelines for onshore wind which are extremely explicit with regards to what constitutes the community and how the community is defined⁴ (DECC, 2014a), both the UKOOG and UK government have failed to define what is meant by the term *community* in relation to shale

gas development⁵. This has implications for who or what is entitled to receive such payments which has a significant impact on what the money is spent on, and how a community is able to undertake financial planning. This situation was brought up multiple times during data collection as can be seen:

“So, you split that up and you might have £25,000 and suddenly it’s not quite as much anymore. And, if you look at it, that’s a one off payment of £100,000, it’s not every year, that’s just a one-off. It sounds like a lot but 25-grand doesn’t really go very far at all. So, using that as a reason to say yeah, we think that’s a good idea, and that your, you know, pay-off for that is you having to suffer the inconvenience and having a gas-field develop on your doorstep” (Primary Research: Local Parish Councillor).

“there’s the issue of how the money is used or distributed, who it goes to, because it is quite possible that you could be on a lorry route, um, to a fracking site, outside the Parish in which the site is based and you may not see any of that money. It may end up in a Parish which you don’t belong to where you don’t live, but actually the people that benefit from it haven’t experienced the disturbance so I think there’s a lot of very complicated issues, um, and questions that haven’t been answered on this issue”

(Primary Research: Journalist).

A further definitional difficulty arises in what actually constitutes *fracking* and whether or not shale gas extraction operations that fall outside of specific legal boundaries still constitute fracking. This is important as it may determine whether or not a community is entitled to receive associated financial payments in respect of the right to use sub-surface resources. For instance, the *Infrastructure Act 2015* defines ‘associated hydraulic fracturing’ as hydraulic fracturing that takes place in shale that involves the injection of more than 1,000 cubic metres of fluid at each stage of hydraulic fracturing or more than 10,000 cubic metres of fluid in total (Great Britain. *Infrastructure Act 2015*). Therefore, it is unclear (for example) whether

operations that use less than 1,000 cubic metres of fluid per stage, or less than 10,000 cubic metres of fluid in total will constitute associated hydraulic fracturing. This, in turn, will determine whether companies are legally obliged to provide community financial incentives in respect of their activities.

Additionally, there may be a troublesome relationship between CFI's and local economic losses which could act to devalue the local economic impact of such payments. Studies have found that UHF may decrease the property value of properties situated within communities that host fracking (Gibbons, et al. 2016; Muehlenbachs et al. 2015; Throupe, et al. 2013). This means that whilst a community may broadly benefit from CFI's, these could be negatively counteracted by personal, individual losses in local property value resulting in a community that is socially, environmentally and financially worse off than it was prior to the commencement of drilling operations. Such extensive and negative harms inflicted on a community subjected to UHF has been described by Short and Szolucha (In press) as a form of *collective trauma*. When discussing empirical research conducted with individuals of communities fighting fracking in Lancashire (with specific reference to the planning applications there), Short and Szolucha (In press: 6) describe participants as showing: 'a sense of powerlessness and feelings of depression, a sense of loss, fear, betrayal, guilt, anger, and an emotional rollercoaster ride of highs and lows as the planning process ebbed and flowed through various stages and the appeal process.'

Finally, a further quintessential matter concerning environmental justice arises in determining who is liable for restoring the environment post-UHF, particularly if instances of contaminated land have occurred which may be expensive to remedy. Regulations are clear that mineral operators are responsible for the restoration and aftercare of sites, but in the event that a mineral operator is unable to pay, default responsibility is held by the landowner. This means that, should a situation occur where a fracking company is unable to pay

restoration costs (for example, if a company goes bust through not being able to produce shale gas in an economically successful manner), restoration costs may default to the landowner. This can be seen in planning practice guidance provided by the Department for Communities and Local Government (DCLG) (2014): “Responsibility for the restoration and aftercare of mineral sites, including financial responsibility, lies with the minerals operator and, in the case of default, with the landowner”. Such a situation would create a prime example of environmental injustice whereby individuals, communities and the environment suffer at the expense of energy extraction industries whose anthropocentric justification is to provide consumable energy and contribute to the national economy.

Conclusion

Energy extraction processes create a diverse range of harms from the environmental to the social. Green criminology has seldom interacted with energy harms and energy crimes despite the obvious connections that exist between green criminological study and the often-legal harms created by energy extraction processes. Treadmill of Production theory is one approach that has interacted with energy harms and provides a critical lens through which to analyse ecological withdrawals and ecological additions that lead to ecological disorganization (for more information, see: Stretesky et al. 2014: 13-16; 38-88), however, such an approach has rarely been applied to UHF. The recent emergence of UHF in the UK presents a perfect opportunity for green criminologists to study both legal and illegal actions within fracking processes that lead to environmental and social harms. Similarly, UHF in the UK is also deserving of attention from treadmill theorists and traditional criminologists researching State Corporate Crime⁶.

Through using a combination of primary research and academic literature on UHF, this chapter has discussed the emergence of UHF in the UK, and the social and environmental harms that have occurred from the process overseas which was the first main focus of the chapter. The second main focus was to analyse CFI's and the pursuing ramifications that this may have for environmental justice in the communities that host fracking. In order to do this, the chapter accessed: the extent to which payments can be considered to represent corporate financial bribery; whether one-off grants actually distort community projects in the long-term; problems with defining who and what constitutes the *community*; and the problematic relationship between CFI's and local economic loss. In conclusion, the purpose of CFI's is convoluted and there are several questions that remain unanswered (such as, what is a community and how will CFI's affect communities in both the short-term and long-term). The UK government and onshore oil and gas industry need to be more specific and involved in helping communities to understand their place within such a payment scheme, as is the case with other energy generation sources (such as wind energy, for example).

Notes

- 1 For the purposes of this chapter the terms “fracking”, “hydraulic fracturing” and “unconventional hydraulic fracturing” will be used interchangeably to describe the latter phrase “unconventional hydraulic fracturing”. This terminology is explained in more detail in the section entitled: The Emergence of Unconventional Hydraulic Fracturing in the UK.
- 2 DBEIS produce an *Energy and Climate Change Public Attitude Tracker* (established by the redacted DECC in 2012). Wave 22 of this tracker reported a continued decline

for public support for fracking (at 16%) with public opposition to fracking at 33% (DBEIS, 2017: 5).

- 3 UKOOG (United Kingdom Onshore Operators Group) is the representative body for the UK onshore oil and gas industry.
- 4 For instance, the following quotation is taken from the DECC's best practice guidance for community benefits from onshore wind developments in England (DECC, 2014b: 22): 'identifying interested parties and defining the 'community' - Engagement on community benefit schemes should reach at least the same geographical area as the consultation on the development itself. How the local community is then defined will be shaped by a number of factors, including physical and human geography and local culture, which plays a huge role in determining how a community defines itself. There are a number of different ways in which the community can be defined. Not all local residents will form a single community or group, for example, and there are also divergent forms of community belonging – communities of place and communities of interest (a shared outlook to faith, politics, social interaction, ethnicity or common interests) – both of which may be relevant in the context of community benefits around onshore wind energy projects'.
- 5 Some key texts that are accessible to the public that directly discuss CFI's fail to actually address what is meant by a *community*, such as: Delebarre et al. 2017; DECC, 2014b; UKOOG, 2016.
- 6 An example would be the Secretary of State's decision to over-turn Lancashire County Council's decision to not allow fracking in Lancashire which, though technically legal, severely devalued the purpose of public consultation and community engagement.

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