

concept of genocide, to properly understand the historical origins of the concept, its original intended meaning and practical utility.

Since the 1970s the movement to eradicate ecocide has attracted interest from legal theorists, political scientists and environmental activists, but unlike in the field of genocide studies, there has been no serious definitional debate or conceptual consideration of 'ecocide', nor is there a rich intellectual history of case studies and comparative research on which to draw. This is perhaps because ecocide is still a concept and not an international crime; for while Lemkin had developed a robust concept of genocide prior to its institutionalization in international law in 1948, the field of genocide studies developed well after the crime's codification. Crucially, the Genocide Convention, as we saw earlier, was a key reference point for much scholarly work, and without a similar international crime it is unsurprising that, despite a regrettable amount of potential data sets, there is no coherent field of ecocide studies as yet. This chapter, then, rather than surveying a field of ecocide studies and advocating an understanding of the concept, will first delve into the institutional history of ecocide within the UN system and its connection to the crime of genocide before moving on to discuss a high-profile contemporary articulation of ecocide and the empirical underpinnings of the nexus between genocide and ecocide in the world today.

Our Ecocide Project research into the history of ecocide in the UN system revealed that members and delegates of several UN institutions, including the Sub-Commission on Prevention of Discrimination and Protection of Minorities,¹ the Legal Committee of the General Assembly and the International Law Commission discussed, at different times over a forty-year period, how to define and criminalize severe environmental destruction. These institutions met frequently to discuss the elements and issues involved in formulating such an international crime, including the level of intent required for an offence to constitute 'ecocide' or 'severe damage to the environment'.²

In the years following the implementation of the 1948 United Nations Genocide Convention many governments began to voice their concerns about its effectiveness. Genocide was still a reality in many parts of the world and the Convention seemed to offer little to those groups it was designed to protect. This was, in part, due

2 | THE GENOCIDE-ECOCIDE NEXUS

The neologism 'ecocide', 'eco' meaning ecosystem and 'cide' meaning destruction, has been around for some time. In 1970, during the time of the Vietnam War, a group of scientists coined and propagated the term 'ecocide' to denounce the environmental destruction and potential human health catastrophe arising from the herbicidal warfare programme known as Operation Ranch Hand (Zierler 2011: 14). The scientists' accusation was notable for being levelled against their own government and for effectively forcing national policy to renounce first use of herbicides in future wars (ibid.: 14). Much as happened with genocide, the term 'ecocide' has since entered the popular lexicon and come to mean something somewhat different to its original conception. Unlike genocide, however, the term ecocide has since *expanded beyond its original meaning and context*. As early as 1971 environmental activists soon adopted 'ecocide' as their own, with one writer arguing that 'the message of our day is ecocide, the environment being murdered by mankind ... Our dense, amber air is a noxious emphysema agent; farming - antihusbandry - turns fertile soil into a poisoned wasteland; rivers are sewers, lakes cesspools, and our oceans are dying' (ibid.: 14).

More recent works have used the word 'ecocide' to condemn the Euro-American colonial destruction of indigenous peoples' land-based cultures; the destruction of rainforests around the equatorial world; the corporate takeover and consequent destruction of a Pacific island; the neoliberal debt crisis in developing countries; the alarming trend of accelerated species extinction in recent decades; and the environmental ravages wrought across Eurasia in the pursuit of a totalitarian command economy (ibid.: 14). Nowadays, ecocide is often used in the context of the most pressing environmental issue facing the world, anthropogenic climate change, while some activists have preferred to use the term 'climate genocide' when denouncing carbon-dioxide-emitting corporate operations and the governments that back them and fail to place strong curbs on emissions rates. Nevertheless, despite such usages it's important, as it is with the

to the narrow interpretation of what constituted genocide described above and the omission of much of the cultural method in the Genocide Convention. Concern at the lack of utility eventually led to an extensive United Nations (hereafter UN) inquiry into the effectiveness of the Genocide Convention, and it is in just such a review that we find the first attempt to criminalize environmental destruction in international law.³

Early discussions of ecocide were triggered by extreme environmental damage that was being inflicted on Vietnam, Cambodia and Laos through the use of chemical warfare as part of the US campaign there. Because this was the context in which discussions of ecocide began, and because of the urgency and extremity of the harm being done, early definitions of ecocide tended to be restricted to wartime situations in which intent to cause environmental destruction was present and central. The term 'ecocide' was first recorded at the Congressional Conference on War and National Responsibility in Washington, a two-day conference on the question of American war crimes in Vietnam, where Professor Arthur W. Galston 'proposed a new international agreement to ban ecocide',⁴ arguing that:

After the end of World War II, and as a result of the Nuremberg trials, we justly condemned the wilful destruction of an entire people and its culture, calling this crime against humanity genocide. It seems to me that the wilful and permanent destruction of environment in which a people can live in a manner of their own choosing ought similarly to be considered as a crime against humanity, to be designated by the term ecocide. I believe that the most highly developed nations have already committed auto-ecocide over large parts of their own countries. At the present time, the United States stands alone as possibly having committed ecocide against another country, Vietnam, through its massive use of chemical defoliants and herbicides. The United Nations would appear to be an appropriate body for the formulation of a proposal against ecocide. (Zierler 2011: 14)

In making a link with genocide, Galston was suggesting that environmental destruction can have a genocidal impact but also that the environment can be seen as a victim of ecocide in the same way a social group of people can with genocide. Even so, Galston, it appears,

was no environmentalist. Following interviews with Galston, David Zierler (2011) argues that he 'was not motivated to preserve some indigenous ecological Eden from Western technological predations. If Ranch Hand was an operation of resource extraction, it would not be ecocide.' Such a position places Galston's understanding firmly at odds with contemporary articulations (which we shall explore later), but unlike with Lemkin's conception of genocide, I would suggest that Galston's articulation of ecocide doesn't command the same level of intellectual respect. Lemkin went to great lengths to justify the integrity of his concept, its etymology and its application – the same cannot be said of Galston and ecocide.

In its early incarnation, then, ecocide was envisaged as a crime that would be committed in a war context. In 1972, at the UN Stockholm Conference on the Human Environment, Mr Olaf Palme, then prime minister of Sweden, spoke explicitly in his opening speech of the Vietnam War as an 'ecocide' (Björk 1996). Other heads of state, including Ms Indira Gandhi from India and the leader of the Chinese delegation, Mr Tang Ke, also denounced the Vietnam War on human and environmental terms (*ibid.*). Even so, the Stockholm Conference itself had a broader focus beyond environmental destruction in times of war. Indeed, it drew international attention to environmental issues, especially in relation to environmental degradation and trans-boundary pollution.

While there was no reference to ecocide in the official outcome document of the Stockholm Conference, the potential for a law criminalizing ecocide was widely discussed in the parallel unofficial events, including at the 'Folkets Forum' – the People's Summit – where a working group on the Law of Genocide and Ecocide was established (*ibid.*). 'Almost every popular movement and group of NGOs addressed the issue. A demonstration with 7,000 participants was held' (*ibid.*). Dai Dong, a branch of the International Fellowship of Reconciliation,⁵ sponsored a 'Convention on Ecocidal War' (CEW), which took place in Stockholm, Sweden.⁶ The CEW brought together many people, including Professor Richard A. Falk, expert on the international law of war crimes, and Dr Arthur H. Westing and Dr Egbert L. Pfeiffer, who were both biologists, and was coordinated by John Lewallen (Björk 1996). The CEW called for a UN working group on Ecocidal Warfare, which would, among other matters, seek to define and condemn ecocide as an

international crime of war (ibid.). A draft International Convention on the Crime of Ecocide was prepared for UN consideration by Falk and reproduced in a journal article he published in 1973 (Falk 1973). It recognized that the Genocide Convention was deficient and that there was a need for another international law that could address ecological crimes. Falk's draft convention, though, primarily envisaged ecocide as a military offence, which could be committed in times of war or peace, provided the requisite intent was present.

As with the crime of genocide there was much academic debate over what would constitute the crime and, in particular, whether intent to commit destruction of ecosystems was a necessary element of the crime. John H. E. Fried, a specialist in international law and member of the Lawyers' Committee on Nuclear Policy, believed ecocide to denote 'various measures of devastation and destruction which ... aim at damaging or destroying the ecology of geographic areas to the detriment of human life, animal life, and plant life' (Fried 1972). Even so, it was recognized by others, such as Falk, that ecocide often occurs simply as a consequence of human economic activity rather than being a result of a predetermined, intended direct attack on the environment. Indeed, even though Falk's draft (1973) Ecocide Convention constructed a primarily military offence, he explicitly acknowledged at the outset that 'man has consciously and unconsciously inflicted irreparable damage to the environment in times of war and peace'. Meanwhile Westing stated that 'intent may not only be impossible to establish without admission but, I believe, it is essentially irrelevant' (Westing 1974).

Ecocide and environmental destruction in the UN system: revising the Genocide Convention?

Even though Falk's draft Ecocide Convention was never adopted it was considered by the Sub-Commission on Prevention of Discrimination and Protection of Minorities (Sub-Commission) when it prepared a study for the UN's Human Rights Commission into the effectiveness of the Genocide Convention. The Sub-Commission was asked to consider the addition of ecocide as a *method of genocide* as well as the possible reintroduction of the cultural method into the Genocide Convention. The study was prepared by the Special Rapporteur, Mr Nicodème Ruhashyankiko, with the final draft

published in 1978. At this time many Sub-Commission members were supportive of the idea that additional instruments be adopted.⁷ Within the Sub-Commission Mr Abdelwahab Bouhdiba voiced support for criminalizing ecocide; 'any interference with the natural surroundings or environment in which ethnic groups lived was, in effect, a kind of ethnic genocide because such interference could prevent the people involved from following their own traditional way of life'.⁸ However, Ruhashyankiko concluded:

from the review of the problem of ecocide regarded as a war crime, in chapter IV of the present study, it follows that the question of ecocide has been placed by States in a context other than that of genocide. The Special Rapporteur believes that an exaggerated extension of the idea of genocide to cases of ecocide which have only a very distant connexion with that idea is liable to prejudice the effectiveness of the Genocide Convention.⁹

Nevertheless, in a follow-up to the Ruhashyankiko report, the concept of ecocide surfaced again when the Sub-Commission considered the same basic issue in 1985 – whether or not to expand the Genocide Convention. This time the Special Rapporteur was Mr Benjamin Whitaker.¹⁰ The report stressed the opinion of the members of the Sub-Commission who were vocal in their support for the inclusion of a crime of ecocide.¹¹ Even so, in a non-committal conclusion, Whitaker recommended that 'further consideration should be given to this question'.¹² In subsequent discussions in the Sub-Commission, once again members spoke out in favour of the creation of a law criminalizing ecocide within the Genocide Convention. A draft resolution, prepared for the Commission on Human Rights, submitted as part of the review, recommended that Whitaker expand and deepen the study of the notions of 'cultural genocide', 'ethnocide' and 'ecocide'. In addition, a draft article on cultural genocide had also been prepared¹³ although not adopted. Ultimately, in the Sub-Commission's final report on its 38th session,¹⁴ it was recommended that Special Rapporteur Whitaker further investigate the expansion of the Genocide Convention to include the cultural and ecocidal methods of genocide and report back in its 40th session, which did not happen – it was only a recommendation and not a concrete stipulation.

The UN's International Law Commission While ecocide failed to make it into a revised Genocide Convention – which also failed to appear – the issue of criminalizing environmental destruction in international law did not go away. In the 1980s the UN's International Law Commission (ILC) considered the inclusion of an environmental crime within the Draft Code of Crimes Against the Peace and Security of Mankind¹⁵ ('the Code'). This document eventually became the Rome Statute of the International Criminal Court, adopted in 1998 and entering into force on 1 July 2002. As of July 2012 there are 121 state parties to this internationally legally binding statute.¹⁶ It now codifies four named international crimes – genocide, war crimes, crimes against humanity, and acts of aggression.

The ILC is mandated to promote the progressive development of international law and its codification.¹⁷ Members of the ILC are 'persons of recognized competence in international law [... that] sit in their individual capacity and not as representatives of their Governments'.¹⁸ The ILC sits in session annually from May to July and prepares a report to the Legal Committee, which sits from October to November.¹⁹ From the very outset of the United Nations, the ILC had been assigned by the General Assembly in 1947 to formulate 'the principles of international law recognized in the charter of the Nuremberg Tribunal and in the judgment of the Tribunal' and to 'prepare a draft code of offences against the peace and security of mankind, indicating clearly the place to be accorded to the [aforementioned] principles'.²⁰ The Code was on the agenda of the ILC from 1949 to 1957 and 1982 to 1996. The gap in time arose out of difficulties in defining the Crime of Aggression and, as a result, the General Assembly postponed the drafting of the Code. The Code was revisited between 1982 and 1996; in 1982 Mr Doudou Thiam was appointed as the Special Rapporteur on the topic. His work picked up at the last adoption of the Code by the ILC in 1954.²¹ The first reading began in 1985. The second and final reading began in 1992 and was adopted in 1996. In total, Thiam issued thirteen reports before the Code's final adoption in 1996 and his death three years later.

The years 1984–96 proved to be pivotal; during this time there had been extensive engagement in the ILC about the inclusion of a law regarding extensive environmental damage in the Code. Article

26 of the Code stated, 'an individual who wilfully causes or orders the causing of widespread, long-term and severe damage to the natural environment shall, on conviction thereof, be sentenced ...'. This was in light of legal precedent²² and corresponded with Article 19 of Part I of the draft Articles on State Responsibility: 'wilful and severe damage to the environment' – legislation that the ILC was working on concurrently with the Code.²³

Between 1984 and 1986 consideration of whether to include in the Code 'acts causing serious damage to the environment'²⁴ led some members²⁵ in 1986 to reopen the debate on whether ecocide was a crime of intent.²⁶ Criticisms centred on the inclusion of the element of intent and on the fact that the final draft of Article 26 did not address environmental crime by name – it contains no reference to ecocide. For the purposes of the Code previous drafts were removed and Article 26 was reduced to 'wilful and severe damage to the environment'. After the element of intent had been added, the governments of Australia, Belgium, Austria and Uruguay went on record criticizing the redrafting, in recognition of the fact that ecocide during peacetime is often a crime without intent as it occurs as a by-product of industrial and other activity.

Belgium stated: '[t]his difference between articles 22 [war crimes]²⁷ and 26 [wilful and severe damage to the environment]' does not seem to be justified. Article 26 should be amended to conform with the concept of damage to the environment used in article 22, since the concept of wilful damage is too restrictive.²⁸ Australia objected on the grounds that 'the requisite *mens rea* in Article 26 should be lowered so as to be consistent with Article 22',²⁹ and Austria went on record stating that 'since perpetrators of this crime are usually acting out of a profit motive, intent should not be a condition for liability to punishment'.³⁰

However, the ILC – instead of removing reference to the element of intent from the Article – determined to remove Article 26 altogether. Reactions within the ILC to the announcement of the withdrawal of Article 26 were recorded only in part. Based on the observations recorded at the time, we know that the decision taken was not based on agreement between the parties. Subsequent off-the-record discussions between ILC members failed to further the progress of the debate about the law of ecocide: in 1995 it was decided at least twice to hold informal meetings 'to

facilitate the consultations and ensure a truly frank exchange of views'.³¹ Consequently, in 1995, at the ILC's 47th session, it was decided to establish a further Working Group that would meet at the beginning of the 48th session to examine the possibility of covering the issue of wilful and severe damage to the environment in the draft Code of Crimes Against the Peace and Security of Mankind.³² The group came together at the beginning of the ILC's 48th session in 1996, to consider this far more limited inclusion of crimes of environmental damage in the Code.³³ The members of the Working Group included Thiam, Mr Christian Tomuschat, Mr Mochtar Kusumaatmadja, Mr Alberto Szekely and Mr Chusei Yamada.³⁴ As the group was not listed with the other working groups at the beginning of the 1996 *Yearbook of the ILC*, it has not been possible to detect exactly which members took part in its discussions.

We do know that this Working Group issued a report on the topic entitled 'Document on crimes against the environment'³⁵ by Tomuschat. In his recommendations he suggests:

- a) retaining environmental crimes as a distinct and separate provision; or
- b) including environmental crimes as an act of crimes against humanity; or
- c) including environmental crimes as a war crime.

Despite this document, none of his recommendations was followed up. Worse still, in 1996, at a meeting of the ILC, the then chairman, Mr Ahmed Mahiou, unilaterally decided to remove the crime of ecocide completely as a separate provision. Without putting it to a vote, a decision was made by him despite the remit of the Working Group – 'to work on crimes against the environment'. Szekely immediately objected.³⁶ What was finally put to the vote was far more narrow in scope; all that was left to decide on was whether to include environmental damage solely in the context of a war crime or to include it as a crime against humanity, which would be applicable in peacetime. The result was that the Drafting Committee was notified only to draft the far narrower remit of environmental damage in the context of war crimes, and not in the context of crimes against humanity.³⁷

The exclusion of a crime addressing damage to the environment during peacetime was sudden. Documentation as to why this occurred is hard to find. Our research found just one explanatory comment by the Special Rapporteur of the Code, Mr Thiam of Senegal, who stated in his 13th report³⁸ that the removal was due to comments of a few governments from 1993³⁹ that Thiam describes as being largely opposed to any form of inclusion of Article 26. And so it was that Article 26 was removed completely from the Code. Following further amendments by the Drafting Committee the final legal definition of a crime against the environment adopted by the ILC, and which made it into the final Rome Statute, can be found in Article 8 on 'War Crimes': the intentional creation of 'widespread, long-term and severe damage to the natural environment' – importantly only within a war context.⁴⁰

Mr Christian Tomuschat, a long-term member of the ILC from 1985 to 1996 and a member of the Working Group on the issue of wilful damage to the environment, published a short article in 1996 on the development of the provision on crimes against the environment during the drafting and codification process of the Code, in which he argued that:

One cannot escape the impression that nuclear arms played a decisive role in the minds of many of those who opted for the final text which now has been emasculated to such an extent that its conditions of applicability will almost never be met even after humankind would have gone through disasters of the most atrocious kind as a consequence of conscious action by persons who were completely aware of the fatal consequences their decisions would entail. (Tomuschat 1996)

Thus the Rome Statute's Article 8 (b IV) on War Crimes is the only provision in international crime to hold a perpetrator responsible for environmental damage. Of course, the Article does, however, limit the crime to wartime situations and to intentional damage. In addition to drafting the Code, the ILC also drafted international articles on state responsibility, and a provision linking state responsibility and damage to the environment was adopted in 1976.⁴¹ The ILC prepared draft articles for an act that concerned itself with international liability for trans-boundary harm 'carried out

in the territory or otherwise under the jurisdiction or control of a State'.⁴² One of its draft provisions of 1976 defines environmental damage as an international crime.⁴³ Making states liable for trans-boundary harm was extensively scrutinized by the ILC and the term 'trans-boundary harm' came to refer largely to damage done to the environment by events such as the pollution of the air, sea or rivers, consequences of nuclear pollution, or oil spills.

Ecocide: the missing 5th Crime Against Peace

Although the Code of Crimes Against the Peace and Security of Mankind morphed into the lesser Rome Statute, some states transferred the draft Crimes Against Peace, including ecocide, into their own national penal codes. Vietnam,⁴⁴ no doubt as a consequence of its experiences during the long Vietnam War, was the first country to include a crime of ecocide in its domestic law, followed by Russia⁴⁵ in 1996 after the collapse of the USSR in 1991. Although ecocide had been taken off the table at the United Nations, the crime itself was adopted by states that preferred to include all the draft Crimes Against Peace in their national penal codes. In the aftermath of the collapse of the USSR, over a period of seven years, new states that were formed drew up their own national penal codes. Some have included ecocide as a named Crime Against Peace, specifically Armenia,⁴⁶ Belarus,⁴⁷ Republic of Moldova,⁴⁸ Ukraine⁴⁹ and Georgia.⁵⁰ Georgia identifies the crime of ecocide to 'be punishable by imprisonment extending from eight to twenty years in length'. In addition, three other countries have done the same: Kazakhstan,⁵¹ Kyrgyzstan⁵² and Tajikistan.⁵³

It is reasonable to draw certain conclusions from this institutional history: elements of the international community clearly approve of the legal concept of ecocide and have chosen to deliberately set out the crime in their own national penal codes. Ecocide/environmental destruction was a draft crime that made significant progress through the UN system and in some of the national penal codes there is explicit reference to the fact that ecocide constitutes a crime against the peace and security of mankind, which can be taken as an explicit reference to its earlier institutional standing in the draft Code of Crimes Against the Peace and Security of Mankind. The important point to take from all of this is that at certain points in the past, the international community had deemed ecocide/environmental

destruction to be so serious that it was included in its draft Code of Crimes Against the Peace and Security of Mankind, and was also seriously considered as a missing method of genocide that could be written into the Genocide Convention.

So that was a major aspect of the genocide-ecocide nexus – its important institutional history, initially driven by outrage over the Vietnam War and its environmental destruction. In order to grasp the contemporary conceptual and empirical dimensions of genocide and ecocide, the focus of my research over the last six years, it is necessary to grapple with the implications of what Meadows et al. (1972) called 'the Limits to Growth' and Ed Lloyd Davies' 'process of extreme energy' (see Lloyd-Davies 2013; Short et al. 2015).

Limits to growth and extreme energy The 1972 Club of Rome report *The Limits to Growth* (Meadows et al. 1972) utilized a system dynamics computer model to simulate the interactions of five global economic subsystems, namely: population, food production, industrial production, pollution, and consumption of non-renewable natural resources, the results of which posed serious challenges for global sustainability. A more recent study collated historical data for 1970–2000 (Turner 2007) and compared them with scenarios presented in *The Limits to Growth*. The analysis shows that thirty years of historical data compares favourably with key features of the 'standard run' scenario, which results in collapse of the global system midway through the twenty-first century. The key driver behind the *Limits to Growth* prediction – and arguably the one most poised to quickly cause global economic collapse – is the depletion of non-renewable energy sources, especially of oil and natural gas.⁵⁴ Despite the best efforts of the fossil fuel industry to propagate a paradigm of energy abundance, especially in the United States (Heinberg 2014), global production of conventional oil has already peaked and – barring incredibly unlikely huge new discoveries of easily extracted oil – must soon decline as predicted in *Limits to Growth* (Murray and Hansen 2013). New discoveries of oil and natural gas liquids⁵⁵ have dropped dramatically since their peak in the 1960s, and the world now consumes four to five barrels of oil for every one discovered (Mobbs 2013a; Heinberg 2014: 25). Because oil production from conventional fields drops globally by 5 per cent each year, it is thus assured that such fields will eventually 'run out'.⁵⁶

This downward global trend in oil discovery and supply has not gone unnoticed by the major international actors, namely states and multi- and transnational corporations, which have taken various actions since the end of the Cold War to secure access to remaining conventional oil supplies. An examination of major international conflicts in the Persian Gulf region alone since 1990 demonstrates the determination of countries such as the United States to maintain control of conventional energy resources.⁵⁷ Indeed, conventional energy supplies have become so precious to many states that 'energy security' (Barnett 2001) is now an overriding objective within which foreign and domestic policies situate the procurement of oil (and other energy sources) as a matter of national security. Such a discourse often elevates concern for the global fossil fuel market over other considerations such as the environment and human rights.⁵⁸

This change in rhetoric to boost the perceived necessity of fossil fuels is furthered by the influence of major energy corporations upon state governments (Short et al. 2015). As numerous internationally reaching corporations, such as Exxon Mobil and ConocoPhillips, have developed larger economies than many sizeable states,⁵⁹ their power has correspondingly grown. Since such companies' business models centre on fossil fuels, examples of corporate-state collaboration to further non-renewable energy use may be found in varying arenas, from the more than fifty million dollars Koch Industries spent on lobbying the US government between 1998 and 2010 (Mayer 2010) and the formation of the American Legislative Exchange Council (which brings private corporations together with elected US state officials to draft new legislation) (Bedell 2014), to direct connections between advisers to the UK Cabinet Office and energy sector companies such as Centrica and Riverstone (Mobbs 2013b). Because of the overly close, arguably corrupt and undemocratic, relationships⁶⁰ between politicians and corporate interests, it could be argued that the exclusion of 'the underground injection of natural gas for purposes of storage' and '... of fluids or propping agents ... pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities' from the US Safe Drinking Water Act;⁶¹ the British government's determination to make unconventional energy extraction through hydraulic fracturing an 'urgent national priority';⁶² the failure of the European Union to create legally binding environmental legislation

for hydraulic fracturing;⁶³ and George W. Bush's administration's policy of attempting to 'refute the science of global warming and install in its place economic and environmental policies that not only ignore but deny the views of the scientific community on climate change' (Lynch et al. 2010) are – at the very least in part – results of the wishes of the energy sector. As the 200 largest listed fossil fuel companies spent \$674 billion on developing new energy reserves (five times as much as they spent returning money to shareholders) in 2012,⁶⁴ the energy industry remains invested in pushing the 'limits' as far as they can go.⁶⁵

Though corporations may lobby otherwise,⁶⁶ resource limitations to growth are not the only significant, impending ecological threats to humanity and ecosystems worldwide. Carbon dioxide atmospheric concentrations 'have increased by 40% since pre-industrial times', with concentrations of carbon dioxide, methane and nitrous oxide at their highest level in at least 800,000 years,⁶⁷ and the rate of carbon dioxide release is unprecedented, at least in the last 300 million years. The result of this level of pollution – inherently tied to an insistence on using and depleting non-renewable energy sources (Hönisch et al. 2012) – is the phenomenon of climate change, in this context represented by the anthropogenic increase in the Earth's surface temperature. Since 1880, the average global temperature has increased by roughly 0.85 degrees Celsius, with most of the increase – 0.72 degrees Celsius – occurring in the past fifty years (IPCC 2013). The effects of this global warming are diverse and range from shrinking glaciers and ice sheets to the highest rate of sea level rise in the past 2,000 years and increasingly frequent extreme weather events; all of which clearly result from 'human influence on the climate system'.⁶⁸

Knowing that these results of humanity's addiction to fossil fuels are imminently approaching, global use of oil, natural gas and coal should be immediately curbed. At present, however, fossil fuels still remain the world's main source of energy, accounting for around 81 per cent of global primary energy use (Office of the Chief Economist 2011). This is undoubtedly due, at least in part, to the current, Western-propagated largely fossil-fuel-dependent neoliberal economic model, wherein corporations, being legally bound to pursue profit above all other considerations, continuously, and most often successfully, lobby for favourable legislation, deregulation and

tax incentives. As Bakan noted in his seminal text *The Corporation: The Pathological Pursuit of Profit and Power* (2005), under corporate law, the primary legal duty of the corporation is 'simply to make money for shareholders' and failing to pursue this end 'can leave directors and officers open to being sued'.⁶⁹ Thus, the multitude of multibillion-dollar companies that depend upon the continued global use of fossil fuels have not only a vested interest in advocating for further non-renewable energy extraction, but arguably, in the current energy market, a legal duty to do so – and at the very least an obligation to continue pursuing oil, coal and natural gas extraction as long as it is profitable (and legal) to do so. Thus, while the use of renewable energy sources is growing,⁷⁰ they are forced to compete with an established and highly subsidized⁷¹ non-renewable market, rather than be allowed to replace it.⁷²

Extreme energy As conventional reserves are depleted⁷³ and demand for energy rises, there is increasing pressure to exploit unconventional energy sources.⁷⁴ Michael Klare (2011) first coined the term 'extreme energy' to describe a range of relatively new, higher-risk, non-renewable resource extraction processes that have become more attractive to the conventional energy industry as the more easily accessible supplies dwindle. Edward Lloyd-Davies points out, however, that this definition of extreme energy as a category is highly problematic as it is dependent upon specific examples; it lacks 'explanatory or predictive power' (Lloyd-Davies 2013), and leaves open the question of who decides which extractive techniques qualify. A conceptual understanding would suggest that extreme energy is a 'process whereby extraction methods grow more intense over time, as easier to extract resources are depleted' (Short et al. 2015). The foundation of this conception is the simple fact that those energy sources which require the least amount of effort to extract will be used first, and only once those are dwindling will more effort be exerted to gain similar resources. Extreme energy, in this sense, is evident in the history of energy extraction – in the change from gathering 'sea coal' from British beaches and exploiting 'natural oil seeps', to opencast mining and deep-water oil drilling. Viewed in this light, the concept of extreme energy becomes a lens through which current energy extraction efforts can be explained and the future of the energy industry predicted. Using this extreme energy

lens necessitates an understanding of 'the amount of energy which is needed to obtain energy', as in this process it is that value which is continually rising. This value may be calculated as either 'net energy' or 'energy return on investment (EROI)', whereby net energy is the available energy for use after subtracting the energy required for extraction, and EROI is the percentage of energy produced divided by the amount required for extraction. When charted together, the net energy available to society is seen to decrease along with EROI in a curved mathematical relationship, which forms the 'energy cliff' – i.e. the point at which EROI becomes increasingly low and net energy drops to zero.⁷⁵

In the extreme energy process the economic system can be conceptualized as consisting of two distinct segments, the part which is extracting, refining and producing energy (the energy industry) and everything else, which just consumes energy. What needs to be clearly understood is that the energy industry is in the rare position where the commodity which it produces is also the main resource it consumes. Therefore, as energy extraction becomes more extreme, while the rest of the economy will be squeezed by decreasing energy availability and rising prices,⁷⁶ the energy industry's rising costs will be offset by the rising revenues it receives. The net result will be a reallocation (through the market or otherwise) of resources from the rest of society to the energy industry, to allow the energy industry to target ever more difficult-to-extract resources. This process is ongoing as easier-to-extract resources are depleted, and data from recent extraction methods, such as hydraulic fracturing and tar sands extraction, shows that industry is increasingly lurching towards the net energy cliff. Such action on the part of some of the largest and most commercially successful transnational corporations may only be understood as the logical result of the extreme energy process⁷⁷ – there simply are not enough easier-to-extract resources available.⁷⁸

Despite the obvious negative implications of these developments, the process shows no sign of stopping, but continues towards the precipice at an ever-increasing rate, fuelled by ever-increasing levels of energy consumption. Perpetuated by the global economic 'growth' fixation (Purdey 2010), increasing amounts of energy are consumed each year (International Energy Agency 2013), driving the process over the edge. Of course, industry is not willing to halt the process (Lloyd-Davies 2013) as intense demand further pushes

up the price of energy,⁷⁹ allowing extraction to remain economical – as long as enough resource is extracted at each site and the price stays high. The result is that higher energy consumption leads to faster resource depletion, which in turn results in the acceleration of the extreme energy process. Within this neoliberal economic context of increasing demand and profit potential the results of extreme extraction techniques (Heinberg 2014), and the consequences of continuing the process, are easily trumped in the interests of short-term profiteering and ‘energy security’. Indeed, as Stephanie Malin notes, neoliberal ‘normalization’ of unconventional energy extraction emerges most saliently regarding environmental outcomes and economic development (Malin 2013). Despite the prospective consequences of reaching our limits to growth, and with considerable evidence demonstrating a strong correlation between extraction effort and damage to both society and the environment, the extreme energy process continues to accelerate with potentially disastrous consequences (Lloyd-Davies 2013; see also Huseman and Short 2012; Humphreys 2008).

The depth of connections already established between the extreme energy process and our human right to a ‘minimally good life’ illustrates the otherwise overlooked insidious nature of this insistence upon striving towards the energy precipice. Human rights violations due to climate change and the release of pollutants are yet another side effect of humanity’s dependence on fossil fuels, which grows in magnitude with each decade. The tropics and subtropics have seen droughts increase in intensity and duration since the 1970s,⁸⁰ and diseases such as malaria are affecting larger portions of the population (Patz et al. 2005). Two hundred thousand deaths in the United States each year result from air pollution,⁸¹ while a heat wave across Europe in 2003 (most likely resulting from global climate change; Stott et al. 2004) left roughly 30,000 people dead.⁸² There is strong evidence to suggest that the worst consequences of anthropogenic climate change on human rights have not yet been felt. As predicted in *The Limits to Growth* (Meadows et al. 1972), the effects of climate degradation will rapidly increase with temperature throughout the twenty-first century,⁸³ resulting in large-scale deaths across Europe due to heat stroke,⁸⁴ worsening droughts across continents,⁸⁵ further loss of food and water, and a potential, eventual, extinction-level event for humanity if global emissions are not reduced in accordance

with the latest climate science modelling. Such events, along with resulting unrest, wars and mass migrations (IPCC 2014), threaten people’s rights to life and health worldwide.

The rush to scrape the bottom of the fossil fuel barrel is thus creating a perfect storm for current and future human rights abuses, with ecocidal and genocidal consequences. As resources become scarcer our scramble to use them grows, increasing the political prioritization of fossil fuel extraction over ecosystems, human health and security; while increasing demand also ensures that such resources will run out sooner, which in turn will result in further human rights violations as requirements for food, healthcare and other basic needs are no longer met, to say nothing of the abuses to human security, which would also necessarily increase. These violations will most likely increase exponentially as resources are depleted – at least, that is, until the sharp population decline predicted in *The Limits to Growth* occurs.⁸⁶

In a recent paper Martin Crook and I show how Karl Marx’s classic critique of political economy, and his value analysis more specifically, helps explain the ecologically destructive forces unleashed by capitalist extractive and farming industries. Capitalism is structurally geared towards the social production of commodities in accordance with the imperatives of capital accumulation and exchange value and not in harmony with nature’s laws of conservation, sustainability and natural metabolic cycles. As we shall see later in the book, the Athabasca ‘tar sands’⁸⁷ are a prime example of the artificial fragmentation of the local ecosystem in an attempt to extract oil, with no regard for the anti-ecological effects this transfer of energy and materials has on the local environment and critically downstream indigenous peoples. One of the central ecological contradictions of capitalism is the exponential increase in the throughput of materials and energy needed by the relentless need for ‘growth’ and the natural limits of production. Disequilibrium exists between capital’s ferocious pace in the throughput of energy and materials and nature’s laws, temporal rhythms and metabolic cycles, which eventually provokes an inevitable shortage of materials and an accumulation crisis.⁸⁸ The result is that the price of the relevant raw material will go up as the amount of socially necessary labour time objectified in each individual product or use value rises in relative terms. This process is exemplified by extreme energy as the supply of fossil fuels begins to run up against

natural limits, thus raising the relative amount of objectified labour in a given quantity of fossil fuel, leading, in the medium to long term, to a rise in the average price of fossil fuels. Indeed, within the process of extreme energy, where more complex and costly techniques are required for the extraction of ever-scarcer sources, the very same process unfolds (see Crook and Short 2014). So extreme energy 'as a process' can be seen as both an expression of material shortages and a competitive market response in an attempt to correct the imbalance through the extraction of ever more extreme substitutes. The net effect is to put further pressure both on local ecosystems and the biosphere more generally.

Thus capitalism sets in motion a rampant process of accumulation, which carves up nature and increases the material throughput of production to ever more ecologically unsustainable levels, disturbing the social metabolism of human civilization and leading to a 'metabolic rift' of man from nature (see *ibid.*). The process of extreme energy, and the role of extractive industries within it, are manifestations of the anti-ecological imperatives of capital accumulation, and the drive towards 'unconventional' extraction techniques is a particularly virulent expression of the metabolic rift and the anti-ecological nature of the capitalist value/nature contradiction. The resort to more costly and more environmentally destructive forms of energy extraction within the extreme energy process signifies a particular form of environmental crisis under capitalism caused by material shortages and the natural limits of production.

'Fracking': the latest step in the extreme energy process In addition to the infamous 'tar sands' (see Huseman and Short 2012) in Alberta, Canada, the march towards the net energy cliff is arguably spearheaded in the West by the most recently developed family of extreme energy extraction methods known as 'fracking', a colloquial expression which usually refers to the extraction of shale gas, coal-bed methane (CBM) – termed Coal Seam Gas (CSG) in Australia – and 'tight oil'. The term, however, has become somewhat loaded, such that it is necessary to outline the contrasting uses, and define the senses in which it is invoked in this book.³⁹ In public discourse about 'fracking' different sides often talk past each other, owing to very different understandings of what the issues are, and differing definitions of the term itself. These differences fall along a spectrum

that can be understood in terms of the interests of the parties involved.

Exploitation of unconventional oil and gas is a new, more extreme form of fossil fuel extraction, targeting much less permeable rock formations than previous conventional oil and gas extraction. It is characterized by the drilling of dense patterns of, usually horizontal, wells (up to eight per square mile or more) in conjunction with other more intense processes such as hydraulic fracturing and de-watering. Different rock formations can be targeted, such as shale (Shale Gas & Oil) and coal (Coal Bed Methane), but the negative impacts are very similar and potentially both ecocidal (Hulme and Short 2014) and genocidal. For many local people affected, 'fracking' has come to mean petroleum extraction companies turning up where they live and coating the area in hundreds or thousands of well pads, compressor stations and pipelines alongside large volumes of truck traffic; some liken it to an 'invasion' and 'occupation' (Perry 2012: 81), bringing with it a large variety of negative consequences for them and their environment.

The word 'fracking', however, is derived from 'fracing', a much more narrowly defined industry slang for 'hydraulic fracturing', one particular stage of unconventional petroleum (oil or gas) extraction. A scaled-up form of hydraulic fracturing (high volume), involving injecting fluids under high pressure to crack the rock, is often used to release hydrocarbons during unconventional oil and gas extraction. The communities living with the consequences of unconventional oil and gas extraction are mainly concerned with the impact it has on them and their environment. Unconventional oil and gas extraction is a complex process, involving pad construction, well drilling, casing, stimulation (often including but not limited to hydraulic fracturing), extraction, and transport, along with well plugging and abandonment (or failure to do so). All these stages have a consequent impact on their local environment and, owing to the fact that fracking requires so many more wells covering much larger areas, these impacts mount up to a far greater extent than for conventional extraction and production.

In an era of peaked conventional supplies (see Heinberg 2014) extractive industries are principally concerned with finding new fossil fuels to extract in order to ensure continued profits, the cumulative impacts of which are likely to be seen as little more than simple

'externalities' for the companies involved. Focused as they are on getting gas and oil out of the ground regardless, the industry and their government supporters are concerned to utilize the technologies which can be used to do just that. Moreover, they work on a drilling-site-by-drilling-site basis, and the cumulative impact of the whole process seems to be of little concern. It is also useful in their public relations to focus on micro details rather than the macro picture, and a narrow definition of 'fracking', as simply hydraulic fracturing, helps promote the impression that fracking is simply conventional extraction plus hydraulic fracturing, rather than an entirely different process with very different impacts.

Quite possibly one of the reasons the term 'fracking' has become synonymous with unconventional oil and gas extraction more generally lies in the choices made by the industry in its early promotional pitches to investors. Indeed, in the early part of the last decade, it seems that to raise funds for exploration a simple technological explanation was preferred when pitching to non-experts. The industry chose to focus attention on hydraulic fracturing as the key ingredient out of a complex array of technological processes. It's not difficult to understand why the idea of a new, high-tech well completion method, 'massive slick-water hydraulic fracturing', which was going to single-handedly revolutionize the industry by allowing access to a wealth of previously untapped resources, was an attractive sales pitch to investors. A more accurate view of unconventional oil and gas, as requiring much more effort, drilling greater numbers of much more expensive wells in order to produce much less oil/gas, does not sound like such an attractive proposition in comparison. It is therefore unsurprising that the terminology used to describe the industry (and understanding of the issues involved) has become somewhat skewed by this initial spin.

Given our concern here with the harms of unconventional extraction on people and the environment, the issues raised are the wider ones surrounding the overall effects of the entire more intense extraction process, rather than ones specific to particular technologies the industry may or may not use. For this reason it is far more appropriate to use this wider definition of 'fracking', rather than the more narrowly defined industry slang that has the effect of limiting discourse to just the narrow technical process of hydraulic fracturing itself, as if it could occur in an isolated vacuum without its necessary

production infrastructure. Even so, it should still be acknowledged that since there are often significant levels of confusion surrounding the use of the term, the particular understanding being used should always be defined. Thus, to be clear, in this book 'fracking' is being used in its wider sense to include all of the required industrial elements of hydraulic fracturing, from huge quantities of water, to compressor stations, truck traffic and waste disposal.

In the countries where 'fracking' development has taken place it has been controversial and divisive. Supporters of unconventional gas development often claim that it reduces gas prices, creates employment opportunities and provides 'energy security', all the while producing lower carbon emissions than coal. Its detractors often contest all such claims, usually pointing to contrary data emerging from the USA and Australia. Indeed, in numerous studies from both countries, local communities most affected by developments often cite considerable negative impacts on the environment and human health, including groundwater contamination, air pollution, radioactive and toxic waste, water usage, earthquakes, methane migration, and the industrialization of rural landscapes,⁹⁰ the cumulative effect of which has led to calls for the United Nations Human Rights Council (HRC)⁹¹ to condemn fracking as a threat to basic human rights, particularly the rights to water and health. Fracking development is fast becoming a human rights issue.⁹² The United Nations Environment Programme (UNEP) has issued a 'Global Alert'⁹³ on the issue of fracking development, warning of significant environmental risks to the air, soil and water (contamination and usage competition); ecosystem damage; habitat and biodiversity impacts; and fugitive gas emissions – which will endanger carbon reduction targets. In terms of public health, UNEP⁹⁴ warned of risks of pipeline explosions; release of toxins into air, soil and water; and competition for land and water resources needed for food production; and that unconventional gas would likely be used 'in addition to coal rather than being a substitute'⁹⁵ and would thus pose a threat to the development of sustainable economies.

Most of the academic papers on the impacts of fracking have focused on such issues as the macroeconomic benefits of a 'shale gas revolution', the 'green' credentials of shale gas,⁹⁶ and the levels of environmental impact and responsibility for it.⁹⁷ The few human impact investigations have come from investigative journalists

(Brasch 2012), small NGOs⁹⁸ and documentary film-makers.⁹⁹ While valuable, such studies have been limited in scope and were not comparative. Recently anthropologists and sociologists have started to document the social and political discourses of fracking, and the surrounding social conflicts in discrete Australian communities (De Rijke 2013a, b, c) and perceptions of risk and opportunity in American communities,¹⁰⁰ but they predominantly engage in discourse and perception analysis rather than invoking an impact-based analysis. Taking a broader, more structurally aware approach, a recent study has shown that 'neoliberal logic' has led stakeholders to self-regulate their behaviour in order to facilitate fracking, by seeing its current role in rural industrialization, its potential environmental and health outcomes, and its economic outcomes as part of a 'new normal' (Malin 2013). The consequences of this normalization of loss of agency therefore raise fundamental questions about the ability of communities to resist extractive operations and make informed choices about the sources of their energy.

'Green criminologists' have also called for a more theoretically robust approach to the study of ecological harms and crimes (Stretesky et al. 2013). A recent study by Shelley and Opsal (2014) into the social and ecological impacts of energy extractive practices on local communities implies that green criminologists are starting to investigate this issue, documenting not only illegal actions but also legal processes and outcomes that are 'harmful' to humans, animals and the environment. Green criminologists point to the relevance here of German sociologist Ulrich Beck's 1992 'risk society' thesis (Carrabine et al. 2008: 386), whereby modern industrial societies create many new risks not found in nature but which are largely manufactured through new modern technologies – which were unknown in earlier days. Such risks are associated with the many new technologies that generate new dangers to lives and to the planet itself. These dangers are humanly produced, may have massively unforeseen consequences, and may take many, many thousands of years to reverse. For Beck, these 'manufactured risks' are taking us to the edge of catastrophe, posing 'threats to all forms of life on this planet' and presenting us with an 'exponential growth of risks and the impossibility of escaping them' (see *ibid.*: 386). The emergence of 'green crimes and harms', such as those produced by extreme

energy technologies, are part of these new risks which bring new patterns of environmental harm and potential human rights abuses (Short et al. 2015).

In a recent paper, De Rijke noted 'the extraordinary expansion of the unconventional gas industry has ... led to questions about social power and the rights of individuals and local communities, the role of multinational corporations in politics and rural service provision, as well as related questions regarding fundamental processes of democracy, capitalist economics and social justice ...', while the 'close relationship between governments and powerful multinational corporations brings to the fore questions about political influence and human rights' (De Rijke 2013a: 17). Thus, to address these 'important conundrums', De Rijke advocated further academic research into fracking from multiple perspectives, including social impact assessments. Given the weight of evidence of human impacts that is emerging from countries with a mature fracking industry, such as the United States and Australia, I have suggested that it is time to meet De Rijke's call through the human rights lens, i.e. the creation of comprehensive interdisciplinary human rights impact assessments (HRIAs) of fracking. Such assessments would highlight exactly what is at stake for local communities facing the potential ecological devastation that extreme energy technologies usually bring, and would also allow policy-makers to see disaggregated impact data on groups such as indigenous peoples for whom such development may well have genocidal impacts – a discussion we will have later in the chapters on Canada and Australia.

In the next section we will look at the resurrection of the idea that ecocide could, and should, be an international crime in its own right and not subsumed within genocide, war crimes or crimes against humanity. In particular, we will see that some of the most frequently cited examples that proponents of such a law have in mind when invoking the term ecocide often involve 'unconventional' extreme energy technologies and their production sites, such as Alberta's 'tar sands' and 'fracking' in general.¹⁰¹

The crime of ecocide today

In recent years a campaign to criminalize ecocide in its own right, and as a strict liability offence (see Higgins et al. 2011), was

instigated by international lawyer and environmental activist Polly Higgins.¹⁰² The Eradicating Ecocide¹⁰³ campaign draws attention to the numerous examples of ecocide and its human consequences worldwide, at a time when preventing further ecological destruction couldn't be more pressing. Eradicating Ecocide is one of a number of campaigns¹⁰⁴ that highlights the particularly devastating impact environmental destruction has on indigenous peoples who depend on the health of their local environment not only for their own physical well-being but also for their spiritual and cultural health. Even so, the focus goes beyond the plight of indigenous peoples to eradicating ecocide for the good of the planet, its ecosystems and all those beings that depend on them.

As we have seen, we do not currently have an international crime of ecocide and hence there is no law to prosecute those who are destroying our environment and ecosystems (see *ibid.*). Far from it, under our current neoliberal capitalist order, governments the world over positively encourage such destruction in the name of economic growth (see Crook and Short 2014). We do have an international crime of environmental destruction as a war crime, but this has no applicability in times of peace and 'environmental destruction' doesn't capture our environmental embeddedness, nor the full scale of our predicament, or the role of capitalism and resource extraction in its development. In his seminal text *The Enemy of Nature*, Joel Kovel outlines why we should talk in terms of an 'ecological crisis' rather than an 'environmental' one. His contribution to this area is worth quoting at length:

Society and nature are not independent bodies bouncing off each other, like billiard balls. Therefore, the crisis is not about an 'environment' outside us, but the evolution, accelerating with sickening velocity, of an ancient lesion in humanity's relation to nature. To think in terms of such a relation is *ecological* thinking, which requires that we see the world as an interconnected whole. From this standpoint we are part of that whole, to which we connect as a natural creature whose relation to nature requires that nature be transformed. In other words, our 'human nature' is to be both part of the whole of nature and also distinguished from it by what we do to it. This boundary is called *production*; it is the species-specific activity

that defines us, and its outcome is the economy, the polity, our culture, religion, and the way we inhabit our bodies. Thus human life is complicated, restless, and full of conflict, as every intelligent person knows. We do not have an environmental crisis, then, but an *ecological crisis*, in the course of which our bodies, ourselves, and the whole of external nature are undergoing severe perturbations. Since production is the key to human nature, the ecological crisis is also about what can be called the *conditions of production*. These include energy resources, technologies, and also the bodies who have to get to work each day. (Kovel 2007a)

The Eradicating Ecocide campaign may not endorse an overtly anti-capitalist agenda but in its preference for the concept of 'ecocide' rather than 'environmental destruction' it invokes a holistic understanding of the problem as an *ecological* crisis, and the concomitant need for the protection of ecosystems, rather than an abstract and external 'environmental' crisis. Indeed, Higgins defines 'ecocide' as: 'the extensive damage to, destruction of or loss of ecosystem(s) of a given territory, whether by human agency or by other causes, to such an extent that peaceful enjoyment by the inhabitants of that territory has been severely diminished'.

This definition is the basis of the Eradicating Ecocide campaign's proposed amendment to the Rome Statute, the treaty that established the International Criminal Court (ICC), which entered into force on 1 July 2002.¹⁰⁵ In short, it is envisaged that any extensive damage, destruction to or loss of an ecosystem can constitute ecocide. 'Extensive' can be either widespread, long lasting or severe. To define these terms the campaign invokes the 1977 United Nations Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (ENMOD):

- Widespread: encompassing an area on the scale of several hundred square kilometres.
- Long lasting: lasting for a period of months, or approximately a season.
- Severe: involving serious or significant disruption or harm to human life, natural and economic resources or other assets.

Under the Rome Statute, the ICC can only investigate and prosecute the core international crimes when states are unable or unwilling to do so themselves. These are the existing four Crimes against Peace (genocide, crimes against humanity, war crimes and the crime of aggression), hence the argument that 'ecocide is the missing fifth Crime against Peace' (Gauger et al. 2012).

Higgins outlines two types of ecocide. The first is human-induced or 'ascertainable ecocide' – ecocide caused by human agency, where an individual responsible for the activity can be identified. Usually, Higgins points out, this is corporate-induced ecocide, and she invokes the poster child of extreme energy – the ecological disaster that is the Athabasca tar sands in Alberta, Canada, which we will discuss later on in the book. The second is ecocide by 'other causes', such as catastrophic events like floods or earthquakes, referred to in law as an 'act of God'. These can be termed 'non-ascertainable ecocide' as no one perpetrator can be identified. Of course, this type of ecocide cannot be stopped, but when human-induced ecocides, which destroy carbon sinks and create escalating carbon emissions, are stopped, it is possible that this could reduce the frequency of climatic extremes and mitigate the negative impacts of naturally occurring ecocides.

Following on from Higgins' initiative, a global grassroots supporting campaign has emerged called 'End Ecocide on Earth'.¹⁰⁶ The ultimate goal of the initiative is for ecocide to be recognized as a crime around the world. In their own words: 'this means not only national ecocide crimes in all states but also the recognition that ecocide is an international crime which can be enforced with an international court. To that end, ecocide should be incorporated into the Rome Statute as an international Crime against Peace under the jurisdiction of the International Criminal Court. It is in our collective power to make this change happen, in the years to come till 2017. This is the radical change we need, and we are building a global movement to make it a reality.' Pursuant to their goal the initiative has a three-pronged approach:

- 1) a 'Global Call for International Justice for the Environment & Health' – the initiative, along with nine other organizations, wrote the 'Charter of Brussels', a global call requesting the establishment of a European and an International Criminal Court of

the Environment and Health. The Charter calls for the recognition of environmental crimes as crimes against Humanity and Peace by the United Nations. At the time of writing, the Charter was open for signatures by individuals and organizations and the ultimate plan was to hand it over to Ban Ki-moon, UN secretary-general, during the COP21 Climate Conference in December 2015 in Paris.

- 2) 'Social Mobilization Campaign for COP21' – a plan to mobilize tens of thousands of volunteers and supporters in the streets to demonstrate their dedication to protecting the planet and future generations by demanding a halt to dangerous industrial activities.
- 3) 'Concrete proposal of Criminal Law recognizing Ecocide' – a proposed amendment to the Rome Statute to be drafted by an expert working group in order to include, within the ICC pre-ratifiers, environmental and health crimes. The initiative hopes that organizations joining the Charter's global call and the expert working group will commit to lobby on behalf of the initiative decision-makers in their country, asking them to support the proposed amendment to the Statute of the International Criminal Court.

Leaving aside the thorny issue of likely political opposition, the process of revision of the Rome Statute is remarkably simple in that one member state can propose the amendment to the UN secretary-general, who then distributes the proposal to the other member states during a general assembly or convenes a revision conference. It remains to be seen whether or not a potential crime of ecocide can progress farther within the international system this time around, when the need is much more urgent and pressing than it was in the preceding decades, since, despite this, as we saw earlier, the likely opposition forces are now much stronger – corporate power and influence have grown and the relationships between industry and governments have become even closer. The current anti-ecological, ecocidal rush to deploy the latest extreme energy technologies highlights this depressingly well, raising serious concerns over not just ecosystem protection, but human rights protections and in some cases potential genocidal consequences – as we shall see in later chapters.

If we consider the ostensibly democratic context of the UK, for example, on the surface it may seem that extreme energy technologies like fracking are considered necessary for 'the economic well-being of the UK' and hence 'in the national interest', and are simply being prioritized over individuals' fundamental civil and political rights; but if we look a little deeper, a more politically disturbing picture emerges, especially considering recent evidence likening the precarious nature of the US 'fracking boom'¹⁰⁷ to that of a government-supported 'Ponzi scheme' (Mobbs 2014). Indeed, as Noam Chomsky warns, 'the terms, United States, Australia, Britain, and so on, are now conventionally used to refer to the structures of power within such countries: the "national interest" is the interest of these groups, which correlates only weakly with the interests of the general population' (Chomsky 1999). When investigating the trajectory and impacts of extreme energy developments, a critical awareness of the 'close relationship between governments and powerful multinational corporations', which De Rijke (2013a: 15) warned of with unconventional gas production in Australia, is vital. For example, in the UK much of the public fracking debate has been conducted in a context which involves a government wanting to 'go all out for shale' while at the same time having a 'lead non-executive director' at the Cabinet Office, Lord Browne, who is also the chairman of shale gas company Cuadrilla Resources. There have been illuminating 'freedom of information' requests in the UK that have demonstrated collusion between key politicians and industry figures on such matters as how best to 'manage' public perceptions and manufacture consent in order to 'fast-track' fracking development.¹⁰⁸ Environmental consultant and extreme energy expert Paul Mobbs has highlighted numerous political-industry connections that are deserving of public attention and which raise fears of 'malfeasance' in public office (Mobbs 2013b). Mobbs argues, 'politicians might call for a "balanced debate on shale", but arguably it is they who are peddling a manufactured rhetoric.'¹⁰⁹ This is because the political process has been hijacked by lobbyists paid by the industry, whose manipulative tendrils reach right inside the Government.¹¹⁰ This chapter has illuminated the conceptual and empirical nexus between genocide and ecocide, the pivotal anti-ecological role of capitalist accumulation and the process of extreme energy and the limits to growth.

In the following case studies we will see that *all* of these issues are at play to varying degrees. Indeed, in all the case studies, first and foremost the primary resource at stake is land. In the first two cases, Palestine and Sri Lanka, where violent conflict continues into the present, social identity features prominently in political rhetoric, which can serve to obscure more structural concerns such as access, ownership and use of natural resources. When there are population pressures due to 'settlements', competition over valuable resources increases and then, as Zimmerer notes,

ideology, traditions of inclusion and exclusion, and histories of violence come into play ... Nonetheless, if we accept that resource scarcity can create genocidal violence then we should alter our understanding of the role of ideology, of intention, and ultimately of prevention. Ideology will still be important; however, it might not be the initial cause of violence in each and every case. Rather, resource scarcity – real or perceived – could serve as a cause as well as part of an ideology, whereby ideology becomes the means by which allegedly superfluous human beings are identified. (Zimmerer 2014: 275)

When it comes to the case studies of Australia and Canada, while social and cultural identity issues are fundamental to understanding what is at stake, political disagreements are fought on supposed rational grounds of best 'development' practice and often overtly centre on land acquisition and use, with the environmental, physical and cultural repercussions of state and corporate behaviour often seen as mere 'externalities'.

peoples were exercising their right to Free, Prior and Informed Consent (FPIC) – which is a requirement, prerequisite and manifestation of the exercise of their fundamental right to self-determination as defined in international law – then such changes would not be genocidal. See United Nations Declaration on the Rights of Indigenous Peoples, 2007, especially Article 19, at www.un.org/esa/socdev/unpfi/en/drip.html.

32 The work of Talcott Parsons is arguably the prime example of this; see Parsons (1937) and more generally Parsons (1960).

33 See Wolfe (2006) on this point.

34 See the seminal report of UN Special Rapporteur Erica Daes, 'Indigenous Peoples and Their Relationship to Land, Final Working Paper', Commission on Human Rights, Sub-Commission on the Promotion and Protection of Human Rights, Fifty-third session, at [www.unhcr.ch/Huridocda/Huridoca.nsf/0/78d418c307fa00bc12569900496f2b/\\$FILE/G0114179.pdf](http://www.unhcr.ch/Huridocda/Huridoca.nsf/0/78d418c307fa00bc12569900496f2b/$FILE/G0114179.pdf).

35 Ibid.

36 Which, while in a process of continual change, had a definite historical form. This point is made by Powell (2007: 538) with a Cree example.

2 The genocide–ecocide nexus

1 The Sub-Commission on Prevention of Discrimination and Protection of Minorities undertakes studies and makes recommendations to the Commission concerning the prevention of discrimination against racial, religious and linguistic minorities. Composed of twenty-six experts, the Sub-Commission meets each year for four weeks. It has working groups and established special rapporteurs to assist it with certain

tasks, www.un.org/rights/dpi17174e.htm, accessed 16 July 2012.

2 In international forums the UN Sub-Commission on Prevention of Discrimination and Protection of Minorities used the term 'ecocide' to describe a potential crime involving environmental destruction, while in later years the International Law Commission preferred narrower formulations based around the notion of 'severe damage to the environment'.

3 Sub-Commission on Prevention of Discrimination and Protection of Minorities, *Study of the Question of the Prevention and Punishment of the Crime of Genocide*, Prepared by Mr Nicodème Ruhashyaniko, 4 July 1978, E/CN.4/Sub.2/416.

4 *New York Times*, 26 February 1970, cited in Weisberg (1970).

5 An independent organisation (1970–76) which built awareness among governments and society of damage to nature by human misuse of technology and chemical products.

6 The purpose of the Convention was to describe the destruction of the Indochinese peoples and environments by the United States government; and to call for a United Nations Convention on Ecocidal Warfare, which would receive evidence of the devastation of the human ecology of Indochina caused by the Indochina War, determine which belligerent caused that devastation, request reparations from the responsible belligerent or belligerents, and seek to define and proscribe 'Ecocide' as an international crime of war; www.aktivism.info/rapporteur/ChallengingUN72.pdf, accessed 16 July 2012.

7 Austria, Holy See, Poland, Romania, Rwanda, Congo and Oman; see E/CN.4/Sub.2/416, pp. 11–17; E/CN.4/Sub.2/1998.10.13; E/CN.4/Sub.2/1998.10.18.

REDEFINING GENOCIDE

SETTLER COLONIALISM, SOCIAL DEATH AND ECOCIDE

Damien Short

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- 10 E/CN.4/Sub.2/1985/6.
 11 E/CN.4/Sub.2/1985/6, para. 33.
 12 Ibid.
 13 Ibid., p. 124. Supportive governments: Austria, Holy See, Ecuador, Israel, Oman and Romania.
 14 Report of the Sub-Commission on Prevention of Discrimination and Protection of Minorities on its 38th session, Geneva, 5–30 August 1985, E/CN.4/Sub.2/1985/57.
 15 Draft Code of Offences Against the Peace and Security of Mankind until 1987; see General Assembly Resolution 42/151 of 7 December 1987.
 16 treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mid=sg-no=XVII-10&chapter=18&lang=en, accessed 16 July 2012.
 17 Statute of the International Law Commission, 1947. Adopted by General Assembly Resolution 174 (II) of 21 November 1947, amended by Resolutions 485 (V) of 12 December 1950, 984 (X) of 3 December 1955, 985 (X) of 3 December 1955 and 36/39 of 18 November 1981.
 18 untreaty.un.org/ilc/ilc/membre.htm, accessed 16 July 2012.
 19 untreaty.un.org/ilc/ilc/sessions.htm; www.un.org/en/ga/sixth/66/66_session.shtml, accessed 16 July 2012.
 20 General Assembly Resolution 177 (II) of 21 November 1947.
 21 *Yearbook of the ILC*, 1954, vol. II, pp. 151–2.
 22 The Special Rapporteur refers to following international instruments: the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil Thereof; the Treaty Banning Nuclear Weapon Tests in the Atmosphere in Outer Space and Under Water; the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies; and the Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques; see A/CN.4/377 and Corr. 1, paras 44 and 51, pp. 94–6.
 23 A/CN.4/377 and Corr. 1, para. 46, p. 95.
 24 This was the wording used in 1984; see A/CN.4/377 and Corr. 1, para. 79, p. 100.
 25 *Yearbook of the ILC*, 1986, vol. I: Mr Stephen C. McCaffrey (USA), pp. 119–20, para. 10, Mr Andreas Jacovides (Cyprus), p. 121, para. 28; Mr Ahmed Mahtou (Algeria), p. 128, para. 11; Mr Doudou Thiam (Senegal; Special Rapporteur on the draft Code), p. 175, paras 17–18.
 26 *Yearbook of the ILC*, 1986, vol. II, Pt 2, p. 46, para. 96.
 27 One provision of Art. 22 on war crimes covers damage caused to the environment in times of war: ‘Article 22. Exceptionally serious war crimes: 2. For the purposes of this Code, an exceptionally serious war crime is an exceptionally serious violation of principles and rules of international law applicable in armed conflict consisting of any of the following acts: [...] (d) employing methods or means of warfare which are intended or may be expected to cause widespread, long-term and severe damage to the natural environment; [...]’. See: *Yearbook of the ILC*, 1995, vol. II, Pt 2, p. 97.
 28 *Yearbook of the ILC*, 1996, vol. II, Pt 1, p. 18, para. 27.
 29 *Mens rea* is the necessary element of a crime – in this case intent to inflict environmental damage.
 30 A/CN.4/448 and Add. 1, contained in *Yearbook of the ILC*, 1993, vol. II, Pt 1, p. 66, para. 50 (Australia), and p. 68, para. 30 (Austria).
 31 A/CN.4/448 and Add. 1, contained

- in *Yearbook of the ILC*, 1995, vol. I, 2386th m., p. 52; and 2387th m., pp. 52–3.
 32 ILC(XLVIII)/DC/CRD.3 (included in *Yearbook of the ILC*, 1996, vol. II, Pt 1, para. 1).
 33 The Working Group was established at the 2404th meeting. See vol. I and vol. II, Pt 2, of the *Yearbook of the ILC*, 1995.
 34 *Yearbook of the ILC*, 1996, vol. I, 2428th meeting, p. 5, para. 5. Draft articles on State Responsibility (adopted in 1980). Article 19. International crimes and international delicts (adopted 1980).
 35 Subject to paragraph 2, and on the basis of the rules of international law in force, an international crime may result, *inter alia*, from [...] a serious breach of an international obligation of essential importance for the safeguarding and preservation of the human environment, such as those prohibiting massive pollution of the atmosphere or of the seas.’
 35 ILC(XLVIII)/DC/CRD.3 (included in *Yearbook of the ILC*, 1996, vol. II, Pt 1).
 36 *Yearbook of the ILC*, 1996, vol. I, 2431th meeting, Tuesday, 21 May 1996.
 37 Ibid. Including environmental damage in the context of war crimes: 12 votes in favour to 1, 4 abstentions; in the context of crimes against humanity: 9 votes to 9, 2 abstentions.
 38 A/CN.4/466, 13th report on the draft code of crimes against the peace and security of mankind, by Mr Doudou Thiam, Special Rapporteur. Draft code of crimes against the peace and security of mankind (Part II) – including the draft statute for an international criminal court. Extract from the *Yearbook of the International Law Commission*, 1995, vol. II(t), p. 35 para. 8.
 39 Ibid., para. 2.
 40 Article 8. War crimes: 2. For the purpose of this Statute, ‘war crimes’ means:
 (a) Grave breaches of the Geneva Conventions of 12 August 1949, namely, any of the following acts against persons or property protected under the provisions of the relevant Geneva Convention: [...]
 (b) Other serious violations of the laws and customs applicable in international armed conflict, within the established framework of international law, namely, any of the following acts: [...] (iv) Intentionally launching an attack in the knowledge that such attack will cause [...] widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated; [...]
 41 Article 19. International crimes and International Delict. 3 [A]n international crime may result, *inter alia*, from:
 (d) a serious breach of an international obligation of essential importance for the safeguarding and preservation of the human environment, such as those prohibiting massive pollution of the atmosphere or of the seas. See: *Yearbook of the ILC*, 1980, vol. II, Pt 2, p. 32, and *Yearbook of the ILC*, 1996, vol. II, Pt 2, p. 60.
 42 International liability for injurious consequences arising out of acts not prohibited by international law.
 43 *Yearbook of the ILC*, 1980, vol. II, Pt 2, p. 32: ‘a serious breach of an international obligation of essential importance for the safeguarding and preservation of the human environment, such as those prohibiting massive pollution of the atmosphere or of the seas’.
 44 Penal Code Viet Nam 1990 Art. 278. ‘Ecocide, destroying the natural environment’, whether committed in time of peace or war, constitutes a crime against humanity.

- 45 Criminal Code Russian Federation 1996 Art. 358.
 46 Criminal Code of the Republic of Armenia 2003 Art. 394.
 47 Criminal Code Belarus 1999 Art. 137.
 48 Penal Code Republic of Moldova 2002 Art. 136.
 49 Criminal Code of Ukraine 2001 Art. 441.
 50 Criminal Code of Georgia 1999 Art. 409.
 51 Penal Code Kazakhstan 1997 Art. 161.
 52 Criminal Code Kyrgyzstan 1997 Art. 374.
 53 Criminal Code Tajikistan 1998 Art. 400.

54 As oil and natural gas production peaks and declines, coal becomes increasingly pivotal in maintaining global energy consumption rates; however, this renewed focus on coal, seen in the 'record rate' of coal gasification and coal-to-liquid plant construction of the last decade, will only further exacerbate strained coal resources. Indeed, world coal production continues to increase annually, with an overall increase of over 67 per cent between 1990 and 2013. Even with more conservative estimates of coal production growth and the most opportunistic estimates of global coal reserves – relying on the World Coal Association's production growth rate of 0.4 per cent between 2012 and 2013 remaining constant and the German Federal Institute for Geosciences and Natural Resources' estimate of 1,052 billion tonnes of reserves – the world will 'run out' of coal in just over a century. As that figure assumes no 'updates' to reserve figures (despite nearly every state with 'significant coal resources' reporting a 'substantial downward revision' in reserve estimates made since 1986) or

increase in production rate (despite the sharp decreases in available oil and natural gas during the upcoming decades), it is reasonable to conclude that the limits to coal-dependent growth will also soon be reached. Heinberg (2007).

55 Natural gas liquids (NGLs) are 'hydrocarbons with longer molecular chains', such as propane and butane, within natural gas that are captured and used for heating and industrial purposes. Heinberg (2014: 25).
 56 Conventional natural gas production follows a similar peak and decline bell-curve and is expected to reach its plateau before the mid-twenty-first century. See Mobbs (2013a); Maggio and Cacciola (2012).

57 I have in mind here both the Gulf War of 1990/91 and the Iraq War of 2003–2011, though the UN Security Council sanctions against Iraq in the interim also indicate the willingness of Western states to take international action to gain control of oil exports when native governments are considered unreliable.

58 See *US National Security Strategy, A National Security Strategy for a New Century*, The White House, Washington, DC, 1998.

59 Exxon's revenue is greater than the GDP of Thailand, for instance. Trivett (2011).

60 See the excellent work of investigative journalist Greg Palast on this point – Palast (2002).

61 United States Congress, Energy Policy Act, Pub L. 109–58 (2005).

62 BBC, 'Lords: Fracking should be "urgent priority" for UK', BBC News: Business, 8 May 2014, www.bbc.co.uk/news/business-27312796.

63 Damian Carrington, 'UK defeats European bid for fracking regulations', *Guardian*, 14 January 2014, www.theguardian.com/environment/2014/

renewables, biofuels dwarfed by supports for fossil fuels', about.bnef.com/press-releases/subsidies-for-renewables-biofuels-dwarfed-by-supports-for-fossil-fuels/.

72 This concept is perhaps best illustrated by the insistence from both industry and governments that hydraulic fracturing will allow natural gas to replace the use of coal and thus reduce the emission of greenhouse gases, when in actuality the abundance of hydraulic fracturing in the United States has simply lowered the price of US coal and driven up exports. Damian Carrington, 'Fracking boom will not tackle global warming, analysis warns', *Guardian*, 15 October 2014, www.theguardian.com/environment/2014/oct/15/gas-boom-from-unrestrained-fracking-linked-to-emissions-rise; Grose (2013).

73 *Ibid.*
 74 UNEP, 'Athabasca oil sands, require massive investments and energy and produce massive amounts of oil and CO₂ – Alberta (Canada)', United Nations Environment Programme 54, Global Environment Alert Service (2011): 1–5; UNEP, 'Oil palm plantations: threats and opportunities for tropical ecosystems', United Nations Environment Programme 73, Global Environment Alert Service (2011): 1–10.

75 Euran Mearns, 'The global energy crises and its role in the pending collapse of the global economy', Paper presented at the Royal Society of Chemists, Aberdeen, Scotland, 29 October 2008.
 76 At the time of writing oil prices were in decline but the finite nature of the resource guarantees that prices will again rise.
 77 David J. Murphy, 'EROI, insidious feedbacks, and the end of economic growth', Paper presented at the Sixth Annual Conference of the Association

Jan/14/uk-defeats-european-bid-fracking-regulations.

64 The Economist, 'Energy firms and climate change: unburnable fuel', *The Economist*, 4 May 2013, www.economist.com/news/business/21577097-either-governments-are-not-serious-about-climate-change-or-fossil-fuel-firms-are.

65 For more on corporate-state connections, see Chomsky (2013); Palast (2002).

66 For example, the American Enterprise Institute, which receives funding from ExxonMobil and other companies in the energy sector, 'offered a \$10,000 incentive to scientists and economists to write papers challenging the IPCC findings' after the Intergovernmental Panel on Climate Change released its fourth assessment report in 2007. Jones and Levy (2009).

67 IPCC, 'Summary for Policymakers', in IPCC (2013).

68 IPCC, 'Summary for Policymakers', in IPCC (2013).

69 Hinkley (2002); Bakan (2005). For further reading on the economic model and psychology under which corporations operate, see Elson (2002) and Connolly (2012). Notably, even privately held companies, such as Koch Industries, have a monetary interest in maintaining global fossil fuel use, as long as non-renewable energy sources continue to generate profit.

70 US Energy Information Administration, 'Renewable & alternative fuels', www.eia.gov/renewable/.

71 For example, in 2009 approximately \$43–46 billion was provided to renewable and biofuel technologies, projects and companies by the governments of the world, compared with the \$577 billion spent on fossil fuel subsidies in 2008. Bloomberg: New Energy Financer, 'Subsidies for

- for the Study of Peak Oil (ASPO), Washington, DC, 7–9 October 2010.
- 78 On this point see also Heinberg (2014).
- 79 Notwithstanding the current, inevitably temporary, geopolitically induced price reduction, prices will undoubtedly rise over time as supply declines; see Mobbs (2015).
- 80 IPCC, 'Summary for Policymakers', in IPCC (2007).
- 81 Laboratory for Aviation and the Environment, 'Air pollution causes 200,000 early deaths each year in the US', Massachusetts Institute of Technology, lae.mit.edu/?p=2821.
- 82 Alok Jha, 'Boiled alive', *Guardian*, 26 July 2006, www.theguardian.com/environment/2006/jul/26/science.g2.
- 83 IPCC, 'Projections of Future Changes in Climate', in IPCC (2007).
- 84 World Health Organization (WHO) Regional Office for Europe, *Euroheat: Improving Public Health Responses to Extreme Weather Heat-Waves. Summary for Policy-Makers*, World Health Organization, Copenhagen, 2009.
- 85 IPCC, 'Projections of Future Changes in Climate', in IPCC (2007).
- 86 See Barry and Woods (2010); Nafeez Ahmed, 'Are you opposed to fracking? Then you might just be a terrorist', *Guardian*, 21 January 2014, www.theguardian.com/environment/earth-insight/2014/jan/21/fracking-activism-protest-terrorist-oil-corporate-spies; Human Rights Council, 'Report of the Special Rapporteur on the Human Right to Safe Drinking Water and Sanitation: Mission to the United States of America', A/HRC/18/33/Add.4, 2011: 10–11.
- 87 See Huseman and Short (2012) for a full definition of this extraction process.
- 88 See Crook and Short (2014). Marx's analysis of the accumulation crisis brought on by materials supplies,

- disturbances operates on two levels: first, it focuses on the conditions of crisis caused by fluctuations in the value of the materials in question brought on by shortages; and secondly, it relates to the indirect fluctuations in 'prices' brought on by the resultant competition, speculation and the credit system. See Marx, *Theories of Surplus Value*, vol. 2, Progress Publishers, Moscow, 1968, p. 515. For further elaboration of the contradiction between 'nature's time' and 'labour's time' see Marx and Engels (1967: 118).
- 89 For more on this see Short et al. (2015).
- 90 Reports of considerable negative impacts go well beyond the anecdotal realm; see, for example, environmental and health studies such as Brown (2014); McDermott-Levy et al. (2013); Moore et al. (2014); Osborn et al. (2011); and Vengosh et al. (2014). And social scientific enquiries such as Perry (2012); Anderson and Theodor (2009); Apple (2014); Beach (2013); Gramling and Freudenberg (1992); Fleming and Measham (2014).
- 91 Environment and Human Rights Advisory, *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas*, EHRA, Oregon, 2011, www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf.
- 92 See Short et al. (2015); Elliot and Short (2014); Grear (2014); Grear et al. (2014).
- 93 UNEP, 'Gas fracking: can we safely squeeze the rocks?', United Nations Environment Programme, Global Environment Alert Service, 2012, www.unep.org/alert-service/2012/06/06/gas-fracking, pp. 6–7.
- 94 *Ibid.*, pp. 6–7.
- 95 *Ibid.*, pp. 7–9.12.
- 96 Howarth et al. (2011); Howarth et al. (2012); Howarth (2014).
- 97 Osborn et al. (2011). See also Ishtar Santos and Damien Maher,

- Pateron held urgent meeting for fracking boss, documents show', *Guardian*, 21 March 2014, www.theguardian.com/environment/2014/mar/21/owen-pateron-urgent-meeting-fracking-cuadrilla-lord-browne; 'Emails reveal UK helped shale gas industry manage fracking opposition', *Guardian*, 17 January 2014, www.theguardian.com/environment/2014/jan/17/emails-uk-shale-gas-fracking-opposition; 'George Osborne urges ministers to fast-track fracking measures in leaked letter', *Guardian*, 26 January 2015, www.theguardian.com/environment/2015/jan/26/george-osborne-ministers-fast-track-fracking.
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3 Palestine

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- 100 Anderson and Theodor (2009); Schafft et al. (2013); Schafft et al. (2014).
- 101 See www.endecocide.org/examples/ and see the *Guardian* newspaper's ten worst ecocides at www.theguardian.com/environment/gallery/2010/may/04/top-10-ecocides-#?picture=361634449&index=0.
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- 103 See eradicatingecocide.com/.
- 104 E.g. Survival International, Forest Peoples' Alliance, Raven Trust, Cultural Survival and many more.
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- 106 www.endecocide.org/strategy/.
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