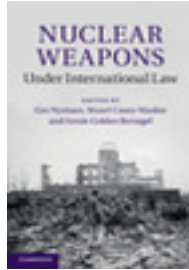


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Nuclear Weapons under International Law

Edited by Gro Nystuen, Stuart Casey-Maslen, Annie Golden Bersagel

Book DOI: <http://dx.doi.org/10.1017/CBO9781107337435>

Online ISBN: 9781107337435

Hardback ISBN: 9781107042742

Paperback ISBN: 9781316500699

Chapter

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Chapter DOI: <http://dx.doi.org/10.1017/CBO9781107337435.018>

Cambridge University Press

Use of nuclear weapons and protection of the environment during international armed conflict

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Introduction

Nuclear weapons are potentially the most destructive weapons ever invented. The almost unimaginable impact of the use of nuclear weapons, including on the environment, was recognised by the International Court of Justice (ICJ) in its 1996 Advisory Opinion on the legality of the threat or use of nuclear weapons¹ (hereafter, Nuclear Weapons Advisory Opinion). As the ICJ recognised, their characteristics render nuclear weapons:

potentially catastrophic. The destructive power of nuclear weapons cannot be contained in either space or time. They have the potential to destroy all civilization and the entire ecosystem of the planet. The radiation release by a nuclear explosion would affect health, agriculture, natural resources and demography over a very wide area. Further, the use of nuclear weapons would be a serious danger to future generations. Ionizing radiation has the potential to damage the future environment, food and marine ecosystem, and to cause genetic defects and illness in future generations.²

In the case of a use of nuclear weapons, however, the Court's discussion of the relevant rules of public international law governing the protection of the environment is rather general. The Court stated in this regard:

States must take environmental considerations into account when assessing what is necessary and proportionate in the pursuit of legitimate military objectives. Respect for the environment is one of the elements that go to assessing whether an action is in conformity with the principles of necessity and proportionality ...

The Court thus finds that while the existing international law relating to the protection and safeguarding of the environment does not specifically

¹ ICJ, *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 8 July 1996, para. 35 (hereafter, Nuclear Weapons Advisory Opinion). For more information on the characteristics of nuclear weapons and the effects of nuclear explosions, see E. V. Koppe, *The Use of Nuclear Weapons and the Protection of the Environment during International Armed Conflict* (Oxford: Hart Publishing, 2008), pp. 47–105.

² Nuclear Weapons Advisory Opinion, para. 35.

prohibit the use of nuclear weapons, it indicates important environmental factors that are properly to be taken into account in the context of the implementation of the principles and rules of the law applicable in armed conflict.³

In view of the environmental consequences of the use of any nuclear weapon, the general concern for the environment during armed conflict since 1972,⁴ and the development of specific rules of public international law in this area, the ICJ's analysis might appear rather unambitious. Further, it is surprising that the Court chose to discuss rules protecting the environment during armed conflict separately from its assessment of the legality of the use of nuclear weapons under 'the law applicable in armed conflict, in particular humanitarian law' (para. 36).

In view of recent developments relating to the possession and use of nuclear weapons⁵ and renewed interest in the law governing the protection of the environment in relation to armed conflict,⁶ further clarification of the applicable law is warranted. This chapter seeks to clarify the scope of the relevant rules of the law of armed conflict and to assess, *in abstracto*, the legality of use of nuclear weapons under these rules.⁷ It first describes relevant rules of treaty law

³ Nuclear Weapons Advisory Opinion, paras. 30, 33.

⁴ Principle 26 of the Stockholm Declaration provides: 'Man and his environment must be spared the effects of nuclear weapons and all other means of mass destruction' (emphasis added) (UN doc. A/CONF.48/14/Rev.1). See also para. 5 of the 1982 World Charter for Nature (A/Res/37/7), Principle 24 of the 1992 Rio Declaration (UN doc. A/CONF.151/26/Rev.1 (Vol. I)), and A/Res/47/37 (protection of the environment during armed conflict) in this context.

⁵ See the International Conference on the Humanitarian Impact of Nuclear Weapons, hosted by Norway in Oslo on 4–5 March 2013, available at: www.humimpact2013.no, and Resolution 1 of the Council of Delegates of the International Red Cross and Red Crescent Movement, Geneva, 26 November 2011, which focuses on the elimination of nuclear weapons. See also President Obama's announcement in Berlin on 19 June 2013 that he would seek a further reduction of deployed nuclear weapons from the level established with Russia in the New START treaty. See The White House, Office of the Press Secretary, 'Fact Sheet: Nuclear Weapons Employment Strategy of the United States', 19 June 2013, available at: www.whitehouse.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states.

⁶ In 2011 the International Law Commission (ILC) decided to include the protection of the environment in relation to armed conflicts in its long-term programme of work. UN doc. A/66/10, Report of the International Law Commission, Sixty-third session (26 April–3 June and 4 July–12 August 2011), para. 365. See ILC, 'Protection of the environment in relation to armed conflicts', last updated 5 June 2013, http://legal.un.org/ilc/guide/8_7.htm.

⁷ Protection of the environment during armed conflict also follows from *jus ad bellum* and *jus pacis*. The protection of the environment during armed conflict under *jus ad bellum* follows from the establishment by the Security Council in 1991 of Iraq's responsibility for all environmental damage resulting from its illegal use of force against Kuwait (Resolution

relating to the protection of the environment during international armed conflict (Section A). It then discusses protection of the environment during armed conflict under customary international law (Section B). The chapter ends with a brief conclusion.

A. Protection of the environment under treaty law

The protection of the environment under the law of armed conflict is specifically regulated in four treaties:⁸ the 1976 ENMOD Convention,⁹ 1977 Additional Protocol I,¹⁰ the 1980 Incendiary Weapons Protocol (Protocol III to the 1980 Convention on Certain Conventional Weapons)¹¹ and the 1998 Rome

687, para. 16). The protection of the environment during armed conflict under *jus pacis* follows from the continuing applicability of rules of international environmental law in the relationship between belligerents and non-belligerents and in the relationship between belligerents *inter se*. According to the ILC, treaties relating to the international protection of the environment are presumed to remain fully operational during armed conflict due to their subject matter. See Article 7 and Annex under (g) of the 2011 Draft Articles on the Effects of Armed Conflicts on Treaties (UN doc. A/66/10), which was commended by the UN General Assembly in its Resolution 66/98 of 9 December 2011. For a discussion of the protection of the environment during armed conflict under *jus ad bellum* and *jus pacis*, see Koppe, *The Use of Nuclear Weapons*, Chapters 4 and 5. On the relationship and overlap between *jus ad bellum* and *jus in bello*, see E. V. Koppe, 'Compensation for War Damages under Jus ad Bellum' in: A. de Guttry, H. H. G. Post and G. Venturini (eds.), *The 1998–2000 War between Eritrea and Ethiopia: An International Legal Perspective* (The Hague: T. M. C. Asser Press, 2009).

⁸ The law of neutrality, which is part of the law of armed conflict and which prescribes the inviolability of the territory of neutral states (see Article 1 of 1907 Hague Convention V Respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land), may have a significant impact on protection of the environment during armed conflict. However, the law of neutrality in case of environmental harm may have been effectively displaced by the continuing applicability of rules of international environmental law between belligerent states and non-belligerent states. For more discussion, including details of state practice regarding compensation paid by Allied Powers for damage caused in Switzerland by shockwaves from bombing attacks on a German border town during the Second World War, see Koppe, *The Use of Nuclear Weapons*, pp. 297–308 and 335–64.

⁹ Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques, New York, 10 December 1976, in force 5 October 1978, 1108 UNTS 151 (No. 17119).

¹⁰ Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), Geneva, 8 June 1977, in force 7 December 1978, 1125 UNTS 3 (No. 17512).

¹¹ Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III) to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, Geneva, 10 October 1980, in force 2 December 1983, 1342 UNTS 137 (No. 22495).

Statute of the International Criminal Court (ICC Statute).¹² Of these four treaties, only 1977 Additional Protocol I is directly relevant to the present discussion. ENMOD is not specifically relevant because its Article I prohibits use of environmental modification techniques as such, irrespective of any use of nuclear weapons.¹³ The 1980 Incendiary Weapons Protocol is not relevant since nuclear weapons do not fall within the definition of incendiary weapons under that Protocol.¹⁴ Lastly, the ICC Statute leads to individual criminal responsibility rather than state responsibility and will therefore not be discussed in any detail.

1. Articles 35(3) and 55, 1977 Additional Protocol I

Additional Protocol I to the four 1949 Geneva Conventions was negotiated in Geneva between 1974 and 1977 and was intended to reaffirm and develop international humanitarian law (IHL). The Protocol merges the classic conduct of hostilities law of The Hague with the humanitarian law of Geneva, with a

¹² Rome Statute of the International Criminal Court, Rome, 17 July 1998, in force 1 July 2002, 2187 UNTS, 90 (No. 38544).

¹³ Even if nuclear weapons were used to manipulate natural processes, for example to cause tsunamis or earthquakes as explained in the Convention's Understanding Relating to Article II, it would still be the use of the environmental modification technique, and not the use of nuclear weapons as such, that would constitute a violation of Art. I of ENMOD. Although reference to the use of herbicides in the Final Declaration following the Second Review Conference of the states parties to ENMOD in 1992 could be interpreted as broadening the scope of ENMOD ('The Conference confirms that the military or any other hostile use of herbicides as an environmental modification technique in the meaning of Article II is a method of warfare prohibited by Article I if such use of herbicides upsets the ecological balance of a region, thus causing widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other Party'), the declaration cites the use of herbicides as an environmental modification technique, and thus does not serve as state practice to go beyond the text of the Convention. The ICJ did not discuss the legality of the use of nuclear weapons as such under ENMOD, despite views expressed by a number of states on this issue (Egypt and Iran argued that the use of nuclear weapons would violate ENMOD; the United States and the United Kingdom opposed this view). See further on the possible applicability of ENMOD to use of nuclear weapons: Koppe, *The Use of Nuclear Weapons*, pp. 130–4, 366.

¹⁴ See the definition in Article 1(1), in which the Protocol defines an incendiary weapon as 'any weapon or munition which is primarily designed to set fire to objects or to cause burn injury to persons through the action of flame, heat, or combination thereof, produced by a chemical reaction of a substance delivered on the target'. Although nuclear weapons have significant incendiary effects (approximately 35 per cent of the explosive energy in the case of a fission weapon and 38 per cent in the case of fusion weapons), the primary effect of a nuclear explosion is a shock wave (approximately 50 per cent in the case of a fission weapon and 54 per cent for a fusion weapon). See Koppe, *The Use of Nuclear Weapons*, pp. 69, 73–4. Further, the heat of a nuclear explosion is not produced by a chemical reaction and the Protocol is annexed to the 1980 Convention on Certain Conventional Weapons, which would *ipso facto* render application to nuclear weapons problematic.

view to enhancing protection of the victims of armed conflict.¹⁵ Among the Protocol's 102 Articles, two provisions specifically govern protection of the environment during international armed conflict: Article 35(3) and Article 55.¹⁶ Article 35(3) provides that:

It is prohibited to employ methods or means of warfare which are intended or may be expected, to cause widespread, long-term and severe damage to the natural environment.

Article 55 provides that:

1. Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population.
2. Attacks against the natural environment by way of reprisals are prohibited.

Both provisions aim to protect the natural environment during international armed conflict in the widest possible sense,¹⁷ including the air and marine environment,¹⁸ but do so in different ways. Whereas Article 35(3) lays down a basic rule on means and methods of warfare and is intended to protect the

¹⁵ Nuclear Weapons Advisory Opinion, para. 75.

¹⁶ For a discussion of the possible indirect protection of the environment provided by the customary and conventional rules relating to the protection of civilian objects, see Koppe, *The Use of Nuclear Weapons*, pp. 279–97. Although the environment may indeed qualify as a civilian object, it is submitted that, on the basis of a contextual interpretation of Art. 55, 1977 Additional Protocol I, and in light of the legislative history of Arts. 55 and 35(3), protection of the environment during armed conflict cannot be derived from Arts. 48, 51 and 52 of the Protocol. In relation to the prohibition of excessive collateral damage to the environment and in more detail, see E. V. Koppe, 'The principle of ambiguity and the prohibition against excessive collateral damage to the environment during armed conflict', *Nordic Journal of International Law* 82 (2013), 53–87, at 68–75.

¹⁷ C. Pilloud and J. Pictet, 'Article 55' in Y. Sandoz, C. Swinarski and B. Zimmerman (eds.), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (Geneva: International Committee of the Red Cross (ICRC)/Martinus Nijhoff Publishers, 1987), para. 2126. See also Article II of ENMOD.

¹⁸ The scope of Art. 35(3), 1977 Additional Protocol I does not appear to be limited to the consequences of land, air or naval warfare for the civilian population on land, as is the case for Art. 55 (see Art. 49(3) of the Protocol). Such would follow, among other things, from the text of the ICRC's Draft Protocol that would form the basis of the negotiations at the 1974–77 Diplomatic Conference. The ICRC envisaged the section on basic rules of the law of armed conflict as applying to 'military operations as a whole carried out within the general framework of land, air or sea warfare'. ICRC, *Draft Additional Protocols to the Geneva Conventions of August 12, 1949: Commentary* (Geneva: ICRC, 1973), p. 54, available at: www.loc.gov/frd/Military_Law/pdf/RC-Draft-additional-protocols.pdf. See Koppe, *The Use of Nuclear Weapons*, pp. 154–67.

intrinsic value of the environment, arguably Article 55 aims to protect the environment as a civilian object (Article 55 is included in Chapter III of Part IV which deals with the protection of the civilian population, including civilian objects), in particular because of its importance for the health and survival of the civilian population. The former provision is therefore generally regarded as ecocentric while the latter is considered anthropocentric.¹⁹

Although states drafting 1977 Additional Protocol I were concerned for the environment in times of international armed conflict, particularly after witnessing the damage resulting from the war in Vietnam, they did not mean to prohibit ordinary battlefield damage. Indeed, during the Diplomatic Conference, the United Kingdom observed in relation to Article 55 that the provision struck the necessary balance, protecting the environment against severe damage 'while not making for instance, a tank commander whose tank flattened a clump of trees liable as a war criminal'.²⁰ Further, a conference report stated that:

The time or duration required ... was considered by some to be measured in decades. References to twenty or thirty years were made by some representatives as being a minimum. Others referred to battlefield destruction in France in the First World War as being outside the scope of the prohibition.

The report also observed that:

it is impossible to say with certainty what period of time might be involved. It appeared to be a widely shared assumption that battlefield damage incidental to conventional warfare would not normally be proscribed by this provision.²¹

For those reasons, it was agreed that only under exceptional circumstances would damage to the environment lead to a violation of the law of armed conflict. First, Articles 35(3) and 55 of 1977 Additional Protocol I only prohibit use of means and methods that are either intended or expected to cause damage to the environment. Accordingly, each provision prohibits not only deliberate or direct attacks on the environment, but also attacks where it is reasonably

¹⁹ M. N. Schmitt, 'Green war: an assessment of the environmental law of international armed conflict', *Yale Journal of International Law* 22 (1997), 1–109, at 70–1. Since Art. 35(3) cannot be deduced from fundamental principles of the law of armed conflict (military necessity, distinction, proportionality and humanity), I have argued elsewhere that Art. 35(3) indicates the existence of a new fundamental principle of the law of armed conflict, namely the principle of ambituity. The word ambituity is derived from the Latin word *ambitus*, which means environment. The principle of ambituity would provide for an absolute limitation to the necessities of war. See Koppe, 'The principle of ambituity', 56–61.

²⁰ H. S. Levie, *Protection of War Victims: Protocol 1 to the 1949 Geneva Conventions*, 4 vols. (Dobbs Ferry: Oceana Publications, 1980), Vol. III, p. 272.

²¹ Report of Committee III, Second Session (CDDH/215/Rev.1), in Levie, *Protection of War Victims*, Vol. II, pp. 276–7.

forseeable that they will lead to excessive collateral environmental damage.²² This applies irrespective of the weapons used and requires those who deploy these means or methods of warfare to know or reasonably predict that the attack they will launch will have such detrimental effects. This is an important limiting factor since environmental harm is not always directly visible or demonstrable. Natural processes are difficult to analyse and military commanders may not know how certain activities will impact the environment over the long term.²³

Second, it was agreed that the use of means and methods of warfare would only be prohibited if such means or methods of warfare would lead to 'widespread, long-term and severe' damage to the environment. Indeed, contrary to the drafters of the 1976 ENMOD Convention, the drafters of Articles 35(3) and 55 chose to include a cumulative damage threshold: widespread, long-term *and* severe.²⁴ Since these terms were not defined, they must be interpreted in accordance with the general rules of treaty interpretation as reflected in Articles 31 and 32 of the 1969 Vienna Convention on the Law of Treaties (VCLT).²⁵ Potentially, however, establishing the ordinary meaning of the terms widespread, long-term and severe²⁶ is a highly subjective exercise.²⁷ Although they indicate a high level of seriousness,²⁸ arguably they should be interpreted

²² Schmitt, 'Green War', 72; M. Bothe, 'War and Environment' in R. Bernhardt (ed.), *Encyclopaedia of Public International Law. Volume Four: Quirin, Ex Parte to Zones of Peace* (Amsterdam: Elsevier, 2000), p. 1344; Y. Dinstein, *The Conduct of Hostilities under the Law of International Armed Conflict*, 2nd edn (Cambridge University Press, 2010), p. 204. See also J.-M. Henckaerts and L. Doswald-Beck (eds.), *Customary International Humanitarian Law*, 3 vols. (Cambridge University Press, 2005), Vol. II, p. 877. This interpretation is supported by declarations made by the UK and France upon ratification of 1977 Additional Protocol I, on 28 January 1998 and 11 April 2001, respectively. Both states stated that the risk of environmental damage as a result of the use of means and methods of warfare must be assessed 'objectively on the basis of information available at the time'. See www.icrc.org/ihl.

²³ W. D. Verwey, 'Protection of the environment in times of armed conflict: in search of a new legal perspective', *Leiden Journal of International Law* 8 (1995), 7–40, at 12.

²⁴ Article I of this Convention prohibits the use of environmental modification techniques for hostile purposes if they cause 'widespread, long-lasting or severe effects'.

²⁵ Vienna Convention on the Law of Treaties (VCLT), Vienna, 23 May 1969, in force 27 January 1980, 1155 UNTS 331 (No. 18232).

²⁶ See, e.g., M. Bothe, 'The protection of the environment in times of armed conflict: legal rules, uncertainty, deficiencies, and possible developments', *German Yearbook of International Law* 34 (1991) 54–62, at 56.

²⁷ See Justice Stewart's observation in relation to pornography and the first amendment. Rather than attempting to define pornography, he stated: 'I know it when I see it.' Justice Stewart, concurring, in US Supreme Court, *Jacobellis v. Ohio*, 378 US 184 (1964).

²⁸ After the 1990–91 Gulf War, it was doubted whether the damage resulting from the burning of oil wells and the oil spillage in the Persian Gulf would have met the damage threshold of Arts. 35(3) and 55 if the Protocol had been applicable. US Department of Defense, 'Report to Congress on the Conduct of the Persian Gulf War – Appendix on the Role of the law of War', *International Legal Materials* 31 (1992), 612–44, at 636–7. Similarly, the Committee

in accordance with current views on environmental damage and current standards of international environmental law.²⁹ After all, *tempora mutantur, nos et mutamur in illis*: times change and we change with them.

2. Articles 35(3) and 55 and the use of nuclear weapons

In view of the importance of Articles 35(3) and 55 of 1977 Additional Protocol I for protection of the environment during international armed conflict, it is important to establish the extent to which each provision would apply in the event of any new use of nuclear weapons. Apart from the fact that not all acknowledged and unacknowledged nuclear weapon states are parties to the Protocol (India, Israel, Pakistan and the United States are not, for instance), it has been widely argued that 1977 Additional Protocol I is not, as such, applicable to the use of nuclear weapons. This view was already reflected in the International Committee of the Red Cross (ICRC)'s general introductory note to its Draft Protocols, which were intended to be the basis for the negotiations in Geneva. In this introduction, the ICRC stated that it did not intend to 'broach' (i.e. discuss) problems relating to atomic, bacteriological and chemical warfare.³⁰

This author does not find that argument particularly persuasive. Since the text of the Protocol is of general character and does not refer to any specific weapon or weapon category, it should therefore be presumed to apply to any type of weapon. Further, state practice, including by parties to the Protocol, is divided on whether the Protocol applies to the use of nuclear weapons. Some states are of the opinion that the Protocol, including Article 35(3), applies to all

established to review the NATO bombing campaign against the Federal Republic of Yugoslavia reported to the Public Prosecutor of the International Criminal Tribunal for the former Yugoslavia (ICTY) that damage resulting from the 1999 NATO bombing campaign did not meet the threshold of either provision. ICTY, 'Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign against the Federal Republic of Yugoslavia', *International Legal Materials* 39 (2000), 1257–83, at 1262.

²⁹ Compare Art. 31(3)(c), VCLT, which provides that 'any relevant rules of international law applicable in the relations between the parties' must be taken into account, together with the context of a particular treaty.

³⁰ ICRC, *Draft Additional Protocols to the Geneva Conventions of August 12, 1949: Commentary*, p. 2. In 1956 the ICRC proposed amending the law of armed conflict to enhance protection of the civilian population in armed conflict. The draft included an implied prohibition on the use of nuclear weapons (Art. 14). It is believed that reference to use of nuclear weapons was the reason why the draft did not lead anywhere. ICRC Draft Rules for the Limitation of the Dangers Incurred by the Civilian Population in Time of War, 1956, in D. Schindler and J. Toman (eds.), *The Laws of Armed Conflicts; A Collection of Conventions, Resolutions and Other Documents* (Dordrecht: Martinus Nijhoff, 1988), pp. 251–7. C. Pilloud and J. Pictet, 'Part IV, Section I – General protection against the effects of hostilities' in Y. Sandoz, C. Swinarski and B. Zimmerman (eds.), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (Geneva: International Committee of the Red Cross (ICRC)/Martinus Nijhoff Publishers, 1987), para. 1841.

weapon categories including nuclear weapons.³¹ As discussed below, however, others hold firmly that the Protocol, or at least the new rules included therein, do not apply to use of nuclear weapons.³² Although there was no 'need' for the Court 'to elaborate on the question of the applicability of Additional Protocol I of 1977 to nuclear weapons', the ICJ observed in its Nuclear Weapons Advisory Opinion:

The fact that certain types of weapons were not specifically dealt with by the 1974–1977 Conference does not permit the drawing of any legal conclusions relating to the substantive issues which the use of such weapons would raise.³³

A number of states made declarations upon signature and/or ratification of 1977 Additional Protocol I, including nuclear weapon states France and the UK.³⁴ France declared:

Se référant au projet de protocole rédigé par le comité international de la croix rouge qui a constitué la base des travaux de la conférence diplomatique de 1974–1977, le gouvernement de la république française continue de considérer que les dispositions du protocole concernent exclusivement les armes classiques, et qu'elles ne sauraient ni réglementer ni interdire le recours à l'arme nucléaire, ni porter préjudice aux autres règles du droit

³¹ India, for example, made an explicit statement to this effect upon the adoption of the Protocol by the Diplomatic Conference in 1977. CDDH/SR.39, Annex; VI, 113; Plenary Meeting of 25 May 1977, in *Levie, Protection of War Victims*, Vol. II, p. 279. Before the ICJ, within the framework of the Nuclear Weapons Advisory Opinion, Egypt, Malaysia, the Marshall Islands, Mexico, Nauru, Samoa and Solomon Islands stated, for various reasons, that the Protocol did apply to the use of nuclear weapons. See, e.g., oral statements (CR) of Egypt (CR 95/23, pp. 35–6), Solomon Islands (CR 95/23, p. 60), the Marshall Islands (CR 95/23, pp. 34–5) and Samoa (CR 95/31, p. 46); and written statements in relation to the request of the UN General Assembly of Mexico (para. 74), and of Nauru and Malaysia in relation to the request of the World Health Organization (respectively, pp. 51–2 and 18–19). Note, however, that the Marshall Islands, Malaysia and Nauru were not parties to the Protocol. Nauru acceded to the Protocol only in 2006.

³² Before the ICJ, within the framework of the Nuclear Weapons Advisory Opinion, the UK, the United States, France, the Russian Federation and the Netherlands each stated that the new rules introduced in 1977 Additional Protocol I did not apply to the use of nuclear weapons. See, among other places, oral statements of the UK (CR 95/34, pp. 36–7), the United States (CR 95/34, pp. 73–5), France (CR 95/24, p. 23) and Russia (CR 95/29, pp. 44–5), and the written statement of the Netherlands in relation to the General Assembly request (para. 23). Note, however, that the UK and France were not party to 1977 Additional Protocol I when they made these statements before the Court, and that the United States is still not party to it.

³³ Nuclear Weapons Advisory Opinion, para. 84.

³⁴ Further declarations were made by Belgium, Canada, Germany, Italy, the Netherlands and Spain. Each state declared its understanding that 1977 Additional Protocol I only applied to conventional weapons. Ireland, however, expressed its uncertainty as to the applicability of the Protocol to the use of nuclear weapons. Reservations available at www.icrc.org/ihl.

international applicables a d'autres activités, nécessaires à l'exercice par la France de son droit naturel de légitime défense.³⁵

The UK declared:

It continues to be the understanding of the United Kingdom that the rules introduced by the Protocol apply exclusively to conventional weapons without prejudice to any other rules of international law applicable to other types of weapons. In particular, the rules so introduced do not have any effect on and do not regulate or prohibit the use of nuclear weapons.³⁶

These declarations could be taken to amount to reservations according to Article 2(1)(d) VCLT. Apart from the view that both reservations are based on a misunderstanding of the scope of the Protocol, as was explained above, arguably both reservations are incompatible with the object and purpose of 1977 Additional Protocol I.³⁷ The object and purpose of a treaty must be established by discovering the 'essence' of a treaty, which can be derived from the title of a treaty, its preamble, a particular article, preparatory works or its general architecture.³⁸ The essence of the law of armed conflict, including 1977 Additional Protocol I, is the alleviation of the calamities of war in general,³⁹ and the protection of the victims of armed conflict in particular.⁴⁰ It is clearly contrary to

³⁵ 'Referring to the draft protocol prepared by the International Committee of the Red Cross, which was the basis of the work of the 1974–7 Diplomatic Conference, the Government of France continues to consider that the provisions of the Protocol concern exclusively conventional weapons, and that they can neither regulate nor prohibit the use of nuclear weapons, nor prejudice other rules of international law applicable to other actions necessary for France's exercise of its inherent right of self defence.' Unofficial translation.

³⁶ Available at: www.icrc.org/ihl.

³⁷ See Article 19(c) VCLT. Admittedly, however, no state has yet challenged the legality of the reservations as being incompatible with the Protocol.

³⁸ A. Pellet, 'Article 19: Formulation of reservations' in O. Corten and P. Klein (eds.), *The Vienna Convention on the Law of Treaties: A Commentary*, 2 vols. (Oxford University Press, 2011), vol. I, pp. 447–51.

³⁹ St Petersburg Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight, signed on 11 December 1868, in force 11 December 1868, reprinted in *American Journal of International Law* 1(2), Supplement: Official Documents, 1907, p. 95, preamble. According to the drafters of the St Petersburg Declaration, 'the only legitimate object which States should endeavour to accomplish during war is to weaken the military forces of the enemy' and that for that purpose it was 'sufficient to disable the greatest possible number of men.'

⁴⁰ The High Contracting Parties to 1977 Additional Protocol I believed it necessary 'to reaffirm and develop the provisions protecting the victims of armed conflicts and to supplement measures intended to reinforce their application'; and further reaffirmed 'that the provisions of the Geneva Conventions of 12 August 1949 and of this Protocol must be fully applied in all circumstances to all persons who are protected by those instruments, without any adverse distinction based on the nature or origin of the armed conflict or on the causes espoused by or attributed to the Parties to the conflict'. As such, this reflects the essence or global project of Additional Protocol I.

the aforementioned objects to exclude the use of the most destructive weapon ever invented from the scope of the (new) provisions of the Protocol, including its provisions on the protection of the (human) environment. As the Court recognised:

These characteristics render the nuclear weapon potentially catastrophic. The destructive power of nuclear weapons cannot be contained in either space or time. They have the potential to destroy all civilization and the entire ecosystem of the planet. The radiation released by a nuclear explosion would affect health, agriculture, natural resources and demography over a very wide area. Further, the use of nuclear weapons would be a serious danger to future generations. Ionizing radiation has the potential to damage the future environment, food and marine ecosystem, and to cause genetic defects and illness in future generations.⁴¹

Assuming, however, that Articles 35(3) and 55 of the Protocol would indeed apply to a new use of nuclear weapons, it is likely that such use would breach both provisions. Although damage resulting from a nuclear explosion will depend on a number of factors, such as the type of explosion (sub-surface burst, surface burst or air burst), the type of nuclear weapon involved (fission/fusion weapon, enhanced radiation weapon), the environment where the explosion takes place and the weather at the time of, and after, the explosion, it is nonetheless likely that any nuclear explosion during an armed conflict would cause widespread, long-term and severe damage to the environment, and that such damage would be reasonably foreseeable.⁴²

Both blast and heat will cause significant damage on the ground in case of an air burst, a surface burst or a shallow underground burst, and radioactive contamination resulting from the explosion could cover large areas and last for a significant period of time. Local fallout generally comes down within 24 hours after the explosion in a cigar-shaped pattern, downwind from 'Ground Zero', and is most damaging, since it contains between 40 per cent and 70 per cent of the total radioactivity, and may be of such intensity that certain areas will be severely affected and even remain unfit for human habitation for decades.⁴³

⁴¹ Nuclear Weapons Advisory Opinion, para. 35.

⁴² Some authors assert that the drafters of Arts. 35(3) and 55 did indeed consider non-conventional means and methods of warfare, such as herbicides and chemical weapons, when they elaborated the two provisions. See, e.g., W. A. Solf, 'Article 55: Protection of the Natural Environment' in M. Bothe, K. J. Partsch, and W. A. Solf, *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949* (The Hague: Martinus Nijhoff, 1982), p. 348; and F. Kalshoven, 'Reaffirmation and development of international humanitarian law applicable in armed conflicts: the Diplomatic Conference, Geneva, 1974–1977, Part II', *Netherlands Yearbook of International Law* 9 (1978), 107–38, at 130.

⁴³ In 1998, after sixteen tests over a time-span of twelve years at Bikini Atoll, the International Atomic Energy Agency (IAEA) considered the islands still generally unsafe for habitation forty years after the last test had taken place. The IAEA's conclusion was based on the

B. Protection of the environment during armed conflict under customary international law

In addition to Articles 35(3) and 55, the environment is also protected under three rules of customary international law: Rules 43, 44 and 45 of the ICRC's 2005 Customary International Humanitarian Law Study (CIHL Study).⁴⁴ Rule 43 states:

The general principles on the conduct of hostilities apply to the natural environment:

- A. No part of the natural environment may be attacked, unless it is a military objective.
- B. Destruction of any part of the natural environment is prohibited, unless required by imperative military necessity.
- C. Launching an attack against a military objective which may be expected to cause incidental damage to the environment which would be excessive in relation to the concrete and direct military advantage anticipated is prohibited.

Rule 44 states:

Methods and means of warfare must be employed with due regard to the protection and preservation of the natural environment. In the conduct of military operations, all feasible precautions must be taken to avoid, and in any event to minimise, incidental damage to the environment. Lack of scientific certainty as to the effects on the environment of certain military operations does not absolve a party to the conflict from taking such precautions.

Rule 45 states:

The use of methods or means of warfare that are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment is prohibited. Destruction of the natural environment may not be used as a weapon.

assumption that the local population would almost entirely consume locally produced food, and since substantial amounts of radioactive elements had entered the food chain around Bikini Atoll, this would lead to an annual dose that was considered too high by IAEA safety standards. P. Stegnar, 'Review at Bikini Atoll: assessing radiological conditions at Bikini Atoll and the prospects for resettlement', *IAEA Bulletin* 40(4) (1998), 15–18, at 15–17. Part of the Atoll has meanwhile been rehabilitated. See www.bikiniatoll.com and the Marshall Islands Program of the US Department of Energy at www.eh.doe.gov. Please note, however, that different species have different radio-sensitivities, and humans appear to be more sensitive to nuclear radiation than birds or trees: generally speaking, 'the higher the species on the evolutionary scale, the greater the sensitivity'. J. Rotblat, *Nuclear Radiation in Warfare* (London: Stockholm International Peace Research Institute (SIPRI)/Taylor & Francis, 1981), pp. 100–2. See also A. H. Westing, *Weapons of Mass Destruction and the Environment* (London: SIPRI/Taylor & Francis, 1977), pp. 21–2.

⁴⁴ Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. I, pp. 143–58.

Since it is unlikely that nuclear weapons would ever be used without (imperative) military necessity and highly unlikely that they would be used for the sole purpose of causing damage to the natural environment, this section only discusses the meaning and scope of Rules 43C and 44. The first sentence of Rule 45 generally reflects Articles 35(3) and 55, and indicates that, in the view of the ICRC, both provisions have developed into rules of customary international law, with the United States as a persistent objector to the first sentence of the customary rule in general, and France, the UK and the United States as persistent objectors to the application of the first sentence of the rule to the use of nuclear weapons.⁴⁵ As the scope of the prohibition to use methods and means of warfare expected to cause widespread, long-term and severe damage to the environment was discussed above, Rule 45 will not be further discussed here.

1. *Rule 43C: the prohibition on excessive collateral damage to the environment*

The prohibition on launching an attack against a military objective that may be expected to cause incidental damage to the environment that would be excessive in relation to the concrete and direct military advantage anticipated (or, in short: the prohibition on excessive collateral damage to the environment) is a relatively new manifestation of the principle of proportionality. The principle of proportionality is a fundamental principle of the law of armed conflict – despite not being referred to by the ICJ in the Nuclear Weapons Advisory Opinion – and a ‘general principle on the conduct of hostilities’ (chapeau Rule 43). The prohibition on excessive collateral damage to the environment appears to complement the Treaty and customary prohibitions on excessive collateral damage to civilians and civilian objects as laid down in Article 51(4) and (5)(b) of 1977 Additional Protocol I, and Rule 14 of the ICRC’s CIHL Study. Rule 14 provides (under the heading ‘Proportionality in Attack’) that:

Launching an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination

⁴⁵ *Ibid.*, pp. 151–5. The ICRC’s conclusion has not been generally accepted, however. In 1996 the ICJ rejected the claim that both provisions had customary equivalents (Nuclear Weapons Advisory Opinion, para. 31). In 2006 the drafters of the *Manual on the Law of Non-International Armed Conflict* concluded that Arts. 35(3) and 55 had not developed into rules of customary international law: M. N. Schmitt, C. H. B. Garraway and Y. Dinstein, *The Manual on the Law of Non-International Armed Conflict* (San Remo: International Institute of Humanitarian Law, 2006), p. 59. See similarly Y. Dinstein, *The Conduct of Hostilities under the Law of International Armed Conflict* (Cambridge University Press, 2004), p. 205; Schmitt, ‘Green War’, 76. Hulme is doubtful as to their customary status: K. Hulme, ‘Natural Environment’ in E. Wilmshurst and S. Breau (eds.), *Perspectives on the ICRC Study on Customary International Humanitarian Law* (Cambridge University Press, 2007), p. 232. For further references and discussion, see Koppe, *The Use of Nuclear Weapons*, pp. 220–4, 235–42.

thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, is prohibited.

The customary prohibition on excessive collateral damage to the environment arguably emerged during the 1990s, triggered by damage to the environment caused by Iraq during the 1990–91 Gulf War.⁴⁶ Arguably the familiarity of states, and in particular their (military) legal advisers, with customary and conventional rules governing the protection of civilian objects under IHL, in combination with a growing concern for the environment, in particular after 1991, triggered the emergence of a specific customary prohibition on excessive collateral damage to the environment.

The existence of the customary prohibition is generally accepted in practice,⁴⁷ as is evident from a variety of sources, including treaties and other instruments, national practice, practice of international organisations and conferences, practice of international judicial and quasi-judicial bodies, and the practice of the International Red Cross and Red Crescent Movement.⁴⁸ In relation to Rule 43C, the ICRC refers, among other things, to the 1993 ICRC Guidelines for Military Manuals and Instructions on the Protection of the Environment in Times of Armed Conflict⁴⁹ and the 1994 San Remo Manual on International Law Applicable to Armed Conflicts at Sea,⁵⁰ both of which indicate general acceptance of the prohibition.⁵¹

Further, the ICRC refers to the (implicit) acceptance of the rule by the ICJ and the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia. The Committee stated that ‘military objectives should not be targeted if the attack is likely to cause collateral

⁴⁶ See also W. Heintschel von Heinegg and M. Donner, ‘New developments in the protection of the natural environment in naval armed conflicts,’ *German Yearbook of International Law* 37 (1994), 281–314, at 294; J.-M. Henckaerts, ‘Towards better protection for the environment in armed conflict: recent developments in international humanitarian law,’ *Review of European Community and International Environmental Law* 9 (2000), 13–19, at 18; L. Lijnzaad and G. J. Tanja, ‘Protection of the environment in times of armed conflict: the Iraq–Kuwait War,’ *Netherlands International Law Review* 40 (1993), 169–99, at 184.

⁴⁷ Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. I, pp. 145–6. See also Koppe, *The Use of Nuclear Weapons*, pp. 261–8 for similar or additional evidence.

⁴⁸ Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. II: Practice, Part I, pp. 844–59. Please note that the practice relied on by the ICRC relates to Rule 43 as a whole.

⁴⁹ ICRC Guidelines for Military Manuals and Instructions on the Protection of the Environment in Times of Armed Conflict (A/48/269, Report of the Secretary-General to the General Assembly on the Protection of the Environment in Times of Armed Conflict, of 29 July 1993, Annexing the ICRC Guidelines), Principle 4. See also the 1999 ICRC Model Manual, para. 702(e) and (f).

⁵⁰ San Remo Manual on International Law Applicable to Armed Conflicts at Sea, paras. 46(d) and 13(c).

⁵¹ Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. I, p. 145.

environmental damage which would be excessive in relation to the direct military advantage which the attack is expected to produce.⁵² As noted above, in its Advisory Opinion the ICJ affirmed that: 'States must take environmental considerations into account when assessing what is necessary and proportionate in the pursuit of legitimate military objectives.'⁵³

Additionally, the rule appears to be evidenced (without reference to the 'triple damage standard') by its reflection in military manuals, such as the US Commander's Handbook on the Law of Naval Operations,⁵⁴ as well as by a number of public statements by states within the framework of international organisations. Canada, for example, declared in 1992 to the Sixth Committee of the UN General Assembly:

An important evolution was thus taking place which reflected the importance of the ecological point of view and which should be brought to bear on other questions, such as that of proportionality (the need to strike a balance between the protection of the environment and the needs of war) or that of the distinction between military and non-military objectives. Under the same principle, the environment as such should not be the object of direct attack, and this delegation would like to see that point reflected in the resolution to be adopted after discussion of the item.⁵⁵

Finally, emergence of a customary international law prohibition on excessive collateral damage to the environment appears implicit in Article 8(2)(b)(iv) of the ICC Statute, which qualifies as a war crime:

Intentionally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated.

Article 8(2)(b)(iv), which reflects Article 51(4) and (5)(b) of 1977 Additional Protocol I, is clearly inspired by Articles 35(3) and 55 of the Protocol. It appears to correlate the protection of civilian objects with protection of the environment as laid down in the Protocol.⁵⁶ Although Article 8(2)(b)(iv) provides for individual criminal responsibility for intentionally launching an attack which

⁵² ICTY, 'Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign against the Federal Republic of Yugoslavia', paras. 15 and 18.

⁵³ Nuclear Weapons Advisory Opinion, para. 30.

⁵⁴ NWP 1-14M, The Commander's Handbook on the Law of Naval Operations, para. 8.4.

⁵⁵ A/C.6/47/SR.8, Summary Record of the 8th meeting of the Sixth Committee of the General Assembly on 1 October 1992, para. 20. For further references, see Koppe, *The Use of Nuclear Weapons*, pp. 264–8.

⁵⁶ The distinction between civilian objects and the natural environment in Art. 8(2)(b)(iv) of the ICC Statute may be interpreted as an indication that the environment does not qualify as a civilian object but as an object *sui generis*.

causes excessive collateral damage to the environment, and which must also be widespread, long-term and severe, arguably the provision implies the existence of an independent and 'primary' rule of the law of armed conflict from which the war crime is derived. As such, this primary rule – as expressed in Rule 43C – partly underlies Article 8(2)(b)(iv).

For states parties to 1977 Additional Protocol I, this customary prohibition on excessive collateral damage to the environment complements Articles 35(3) and 55 of the Protocol.⁵⁷ In addition to an absolute prohibition to cause widespread, long-term and severe damage to the environment, states parties to the Protocol are also prohibited from causing excessive collateral damage to the environment during armed conflict. Since the two obligations are of different scope, it must be established which prevails, or rather which must be applied first. It is submitted that any military action that causes damage to the environment must first be assessed against this customary prohibition and only then, if no breach is established, against Articles 35(3) and 55 of the Protocol. The customary prohibition emerged later in time and provides relative protection to the environment (contrary to absolute protection of the environment under Articles 35(3) and 55). As such, it appears that the protection afforded by the law is significantly enhanced by the emergence of a customary prohibition on causing excessive collateral damage to the environment.

The relevance of the prohibition in the case of use of a nuclear weapon will depend on the circumstances of the case. As above, the damage resulting from nuclear explosions will generally be significant and foreseeably so. However, the extent to which any damage to the environment qualifies as 'excessive' will depend on the actual military advantage anticipated, as is apparent from the text of Rule 43C. If a military object qualifies as a highly valuable military target, then its destruction may justify considerable collateral damage. In contrast,

⁵⁷ The customary prohibition on excessive collateral damage to the environment must be distinguished from the prohibition on excessive collateral damage to civilian objects as provided under Art. 51(4) and (5)(b). Although it is arguable that the environment generally qualifies as a civilian object (see, for example, M. Bothe, C. Bruch, J. Diamond and D. Jensen, 'International law protecting the environment during armed conflict: gaps and opportunities', *International Review of the Red Cross* 92 (2010), 569–92, at 576), this author believes that the environment does not benefit from the same protection provided to civilian objects under conventional law, in particular Arts. 51 and 52. There is no indication that the drafters regarded the environment as a civilian object or that they considered the environment as being generally protected under Arts. 51 and 52 or their pre-existing customary equivalents. Arts. 35(3) and 55 qualify as stand-alone provisions, providing for specific protection of the environment, irrespective of their relationship with Arts. 51 and 52, and even though, in hindsight, Arts. 51 and 52 and their customary equivalents would have provided a more effective basis for protecting the environment during armed conflict. For more detail of the argument, see Koppe, 'The principle of ambiguity', 68–75; and von Heinegg and Donner, 'New developments in the protection of the natural environment in naval armed conflicts', 289.

if a military object is not very valuable for military purposes and is not very important for the war effort, its destruction would not seem to justify considerable collateral damage. The prohibition on excessive collateral damage always entails a balancing of factors, and application of this test therefore depends on the circumstances of the case.

2. Rule 44: the customary duty of care for the environment during armed conflict

A customary obligation to employ means and methods of warfare with due regard to the protection and preservation of the environment (Rule 44, first sentence)⁵⁸ appears to imply the existence of a general duty of care for the environment during armed conflict.⁵⁹ After all, 'due regard' is merely a standard to be applied, similar to the obligation to show 'due diligence', which must be applied to prevent transboundary environmental harm,⁶⁰ and which appears to be related to the general obligation on each state 'not to allow knowingly its territory to be used for acts contrary to the rights of other states'.⁶¹ This obligation, also known under the maxim *sic utere tuo ut alienum non laedas*, is arguably based on a general duty of care similar to the one binding private individuals and legal persons, as recognised in the civil law of tort.⁶²

According to the ICRC, Rule 44 follows from 'recognition of the need to provide particular protection to the environment as such'.⁶³ Rule 44 therefore qualifies as ecocentric, similar to Article 35(3) of 1977 Additional Protocol I. It reflects general concern for the environment during armed conflict dating back to 1972, as discussed above, and that is expressed most explicitly in UN General

⁵⁸ Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. I, Rule 44, pp. 147–51. The customary basis of Rule 44 has been criticised by Aldrich and to a lesser extent by Hulme. G. H. Aldrich, 'Customary international humanitarian law – an interpretation on behalf of the International Committee of the Red Cross', *British Yearbook of International Law* 76 (2005), 503–24, at 515; K. Hulme, 'Taking care to protect the environment against damage: a meaningless obligation?', *International Review of the Red Cross* 92 (2010), 675–91, at 686.

⁵⁹ See, Koppe, *The Use of Nuclear Weapons*, pp. 248–56.

⁶⁰ Nuclear Weapons Advisory Opinion, para. 29; ICJ, *Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, Judgment, 25 September 1997 (*Gabčíkovo-Nagymaros case*), para. 53. ICJ, *Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, 20 April 2010 (*Pulp Mills case*), paras. 204–05.

⁶¹ ICJ, *Corfu Channel Case*, Judgment, 9 April 1949, *ICJ Reports* 1949 (*Corfu Channel case*), p. 22.

⁶² See M. A. Fitzmaurice, 'The Corfu Channel Case and the development of international law' in N. Ando *et al.* (eds.), *Liber Amicorum Judge Shigeru Oda* (The Hague: Kluwer Law International, 2002), pp. 132, 137–9. Fitzmaurice relies, among other things, on the dissenting opinion of Judge Azevedo in this regard (Dissenting Opinion Judge Azevedo, pp. 84–5).

⁶³ Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. I, Rule 44, p. 147.

Assembly Resolution 47/37 of 25 November 1992⁶⁴ and the General Assembly's decision to declare 6 November the 'International Day for Preventing the Exploitation of the Environment in War and Armed Conflict'.⁶⁵

The emergence of a duty of care for the environment during armed conflict was identified by the ICRC from a variety of sources, which include treaties and other international instruments and state practice, notably as set out in military manuals and in statements within international organisations and conferences.⁶⁶ For example, several military manuals provide that military operations must be carried out with due regard to the protection of the environment, such as the US Commander's Handbook on the Law of Naval Operations.⁶⁷

Further, a number of states have affirmed (or at least implied) the existence of a duty of care for the environment during armed conflict. In 1991, for example, Canada issued a memorandum that implied the existence of such a duty of care;⁶⁸ and in 1995 and 1996 a number of states expressed concern for the environment during armed conflict and a need to show due regard before the ICJ within the framework of the Nuclear Weapons Advisory Opinion.⁶⁹ Although the Court did not acknowledge the existence of a duty of care for the

⁶⁴ The General Assembly 'expressed its deep concern about environmental damage and depletion of natural resources, including the destruction of hundreds of oil-well heads and the release and waste of crude oil into the sea, during recent conflicts' (Resolution 47/37, preambular para. 3).

⁶⁵ Resolution 56/4 of 5 November 2001. The date of 6 November 2001 marked the tenth anniversary of the extinguishing of the last oil-well fire in Kuwait. W. J. Hybl, Representative of the United States, in Press Release GA/9946 of 5 November 2001, available at: www.unis.unvienna.org/.

⁶⁶ Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. II: Practice, Part 1, pp. 860–71. See also Koppe, *The Use of Nuclear Weapons*, pp. 248–56, for similar or additional evidence.

⁶⁷ NWP 1–14M, *The Commander's Handbook on the Law of Naval Operations*, Department of the Navy, Newport, RI, 2007, para. 8–4. See also the San Remo Manual on International Law Applicable to Armed Conflicts at Sea, in *International Review of the Red Cross* 309 (1995), paras. 44, 11, 46(c), and 13(c); and the ICRC Model Military Manual. A. P. V. Rogers and P. Malherbe, *Fight it Right: Model Manual on the Law of Armed Conflict for Armed Forces* (Geneva: ICRC, 1999), para. 702(c).

⁶⁸ The Memorandum stated that '[t]he customary laws of war, in reflecting the dictates of public conscience, now include a requirement to avoid unnecessary damage to the environment. This includes consideration of environmental effects in the planning of military operations.' Canadian Department of External Affairs, Legal Bureau, 'Memorandum; 12 July 1991; Armed Conflict and the Environment', in B. Mawhinney (ed.), 'Canadian practice in international law: at the Department of External Affairs in 1991–92', *Canadian Yearbook of International Law* 30 (1992), 347–64. See similarly Summary Record of the 18th meeting of the Sixth Committee of the General Assembly on 22 October 1991, UN doc. A/C.6/46/SR.18, para. 13; Summary Record of the 8th meeting of the Sixth Committee of the General Assembly on 1 October 1992, UN doc. A/C.6/47/SR.8, para. 20.

⁶⁹ Sri Lanka, for example, referred to the protection of the environment during armed conflict as an established principle of international law. Written Statement of the Government of Sri Lanka, 20 September 1994, in ICJ, *Legality of the Use by a State of Nuclear Weapons*

environment during armed conflict as such, it did observe that environmental factors and considerations must play an important role in the implementation of the law of armed conflict,⁷⁰ which suggests the existence of an obligation to show due regard for the environment during armed conflict. Finally, a duty of care for the environment is arguably evidenced by the first sentence of Article 55(1) of 1977 Additional Protocol I, which provides: 'Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage.'⁷¹

A duty of care for the environment or an obligation to use methods and means of warfare with due regard for the environment during armed conflict entails that states must take 'all feasible precautions' in the conduct of military operations 'to avoid, and in any event to minimise, incidental damage to the environment'⁷² (Rule 44, second sentence).⁷³ The second sentence of Rule 44 'operationalises' the more general obligation in the first sentence and appears to reflect the general principle of prevention, which qualifies as a principle of international environmental law.⁷⁴ The requirement to take all feasible

in Armed Conflict, 8 July 1996 (hereafter, WHO Advisory Opinion Request), p. 3. Iran, Sweden and New Zealand each expressed a concern for the environment during armed conflict. Written Statement of the Islamic Republic of Iran, Nuclear Weapons Advisory Opinion, p. 4; Written Statement of Sweden, WHO Advisory Opinion Request, p. 5; Written Statement of New Zealand, Nuclear Weapons Advisory Opinion, pp. 17–18. For further and other examples of national practice that also indicate a concern for the environment, see Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. II: Practice, Part 1, pp. 862–7.

⁷⁰ Nuclear Weapons Advisory Opinion, paras. 30, 32 and 33.

⁷¹ According to Hulme, Rule 44 of the ICRC's CIHL Study requiring states to show due regard for the environment is not the same as the obligation to take care of the environment as laid down in Article 55 of 1977 Additional Protocol I. Hulme, 'Taking care to protect the environment against damage', pp. 679–80, 685–6, 691. Compare, however, Hulme's previous discussions of the relationship between Art. 55(1) and Rule 44. K. Hulme, *War Torn Environment: Interpreting the Legal Threshold* (Leiden: Martinus Nijhoff, 2004), p. 108; Hulme, 'Natural Environment', p. 218.

⁷² Rule 44 does not refer to incidental damage to the environment that is excessive in relation to the concrete and direct military advantage anticipated, as Rule 43C does.

⁷³ The second sentence of Rule 44 is similar to Rule 15 (which reflects Art. 57(1) of 1977 Additional Protocol I), which states: 'In the conduct of military operations, constant care must be taken to spare the civilian population, civilians and civilian objects. All feasible precautions must be taken to avoid, and in any event to minimize, incidental loss of civilian life, injury to civilians and damage to civilian objects.' Rule 15 is further detailed in Rules 16–21.

⁷⁴ The principle of prevention was recognised by the ICJ in the 2010 *Pulp Mills* case (para. 101). See also Principle 2 of the 1992 Rio Declaration. Pursuant to the principle of prevention, states must at least carry out an environmental impact assessment prior to authorising a project that may have significant transboundary consequences and during the implementation of a project. *Pulp Mills* case, paras. 204–5. See also Principle 17 of the Rio Declaration. The principle of prevention is further reflected in the 2001 ILC Articles on Transboundary Pollution (UN doc. A/56/10, Draft Articles on Prevention of Transboundary Harm from

precautions 'objectifies' the behaviour of belligerents and requires that belligerents act reasonably or in conformity with what could be reasonably expected from that state under the specific circumstances. As such, an assessment must be made of all environmental risks.⁷⁵

While the obligation to take all feasible precautions to avoid or minimise damage to the environment appears to require foreseeability of environmental damage, Rule 44 further states that '[l]ack of scientific certainty as to the effects on the environment of certain military operations does not absolve a party to the conflict from taking such precautions.' As such, the third sentence of Rule 44 goes further than the other rules of the law of armed conflict that protect the environment and that were discussed above. It reflects the precautionary principle,⁷⁶ which arguably qualifies as a principle of international environmental law,⁷⁷ and which is essential in view of the difficulty of analysing natural processes and assessing environmental damage.

Similar to the prohibition on excessive collateral damage to the environment, this customary duty of care for the environment complements Articles 35(3) and 55 of 1977 Additional Protocol I. For states parties to the Protocol, and for the same reasons as mentioned above in relation to the prohibition on excessive collateral damage to the environment, any military operation or use

Hazardous Activities, with commentaries, 2001). The Articles on Transboundary Pollution provide, in short, that the state of origin must take all appropriate measures to prevent significant transboundary harm or minimise the risk thereof. For that purpose, states must under certain circumstances carry out a proper environmental impact assessment.

⁷⁵ Compare Rule 18, which requires states to 'do everything feasible to assess whether the attack may be expected to cause' excessive collateral damage to the civilian population or civilian objects.

⁷⁶ See Henckaerts and Doswald-Beck, *Customary International Humanitarian Law*, Vol. I, Rule 44, p. 150.

⁷⁷ See Principle 15 of the Rio Declaration, which refers to a precautionary approach in case of scientific uncertainty. The formulation of Rule 44's second and third sentence indicates that the precautionary approach is part of the obligation to take all feasible precautions to avoid or at least minimise incidental environmental damage. A similar approach was taken by the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea in its Advisory Opinion on Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area of 1 February 2011. The Chamber held that 'it is appropriate to point out that the precautionary approach is also an integral part of the general obligation of due diligence of sponsoring States, which is applicable even outside the scope of the Regulations. The due diligence obligation of the sponsoring States requires them to take all appropriate measures to prevent damage that might result from the activities of contractors that they sponsor. This obligation applies in situations where scientific evidence concerning the scope and potential negative impact of the activity in question is insufficient but where there are plausible indications of potential risks. A sponsoring State would not meet its obligation of due diligence if it disregarded those risks. Such disregard would amount to a failure to comply with the precautionary approach' (para. 131). See also Separate Opinion of Judge Cançado Trindade, *Pulp Mills* case, paras. 52–3, 62–92.

of methods or means of warfare must first be assessed against the customary duty of care for the environment. Only if no breach can be established is it necessary to assess such operations against Articles 35(3) and 55.

Rule 44 or the duty of care for the environment is not weapon-specific and could arguably also extend to the use of nuclear weapons. Therefore, if applied to a hypothetical use of nuclear weapons, the relevance of a customary duty of care for the environment during armed conflict may be significant. In particular, the extent to which the nuclear weapon state has taken all feasible precautions to avoid, or in any event to minimise, collateral damage to the environment must be established. It is arguable that nuclear weapon states must assess the potential environmental harm of the use of nuclear weapons and if necessary call off an attack to avoid or at least minimise collateral environmental harm.⁷⁸ Such assessment would need to include a thorough investigation of the possibility of using alternative weapon systems. Nowadays, most nuclear weapon states possess highly sophisticated and powerful weapons that can hit targets over long distances with a high degree of accuracy, which means that use of nuclear weapons may not be necessary to destroy a military objective. Since there is no lack of scientific certainty as to the effects on the environment of the use of nuclear weapons, there is no need to discuss the obligation to take precautionary measures in conformity with Article 44C third sentence.

Conclusion

Nuclear weapons are the most destructive weapons ever invented. The consequences of a single nuclear explosion will likely be devastating, not only for man, but also for the environment. This chapter has sought to clarify the scope of the relevant rules of the law of armed conflict and to assess, *in abstracto*, the legality of use of nuclear weapons under these rules.

Articles 35(3) and 55 of 1977 Additional Protocol I both prohibit the use of methods and means of warfare that are intended or that may be expected to cause widespread, long-term and severe damage to the environment. This author has sought to argue that both rules must be taken into account by nuclear weapon states that have become party to 1977 Additional Protocol I, including France and the UK. In light of the effects of a nuclear explosion, in particular the effects of ionising or nuclear radiation, it is likely that the use of a nuclear weapon during armed conflict will cause widespread, long-term and

⁷⁸ Hulme, 'Taking care to protect the environment against damage', pp. 681–2. See also the illustrative list drawn up by Droege and Tsougas of measures that can be taken to show due regard for the environment: C. Droege and M.-L. Tsougas, 'The protection of the natural environment in armed conflict – existing rules and need for further legal protection', *Nordic Journal of International Law* 82 (2013), 21–52, at 33–5.

severe damage to the environment and will therefore be contrary to Articles 35(3) and 55, to the extent that these provisions are applicable.

This author has also argued that under customary international law, Rules 43C of the ICRC's CIHL Study (the prohibition on causing excessive collateral damage to the environment) and 44 (the general duty of care for the environment during armed conflict) must also be taken into account by all nuclear weapon states. Since both rules provide relative protection to the environment (contrary to the absolute protection of the environment under Articles 35(3) and 55) and since both rules emerged later in time, to the extent the rules are applicable any use of nuclear weapons must first be assessed against these customary rules. Only if no breach of these rules can be established, must the legality of that particular use be assessed – if applicable – against Articles 35(3) and 55.

Rule 43C, which prohibits excessive collateral damage to the environment, requires a balancing of values, namely expected environmental damage and the concrete and direct military advantage anticipated. The question of the extent to which the use of a nuclear weapon would be in conformity with this rule will therefore depend entirely on the circumstances of the case. Rule 44 prescribes that states must take all feasible precautions to avoid and in any event to minimise incidental damage to the environment. It is arguable that Rule 44 requires states to assess in advance the potential environmental harm of a particular method or means of warfare, including use of a nuclear weapon, and to assess to what extent the target can be neutralised by an alternative weapon system. Whether any use of a nuclear weapon is in conformity with this rule will therefore depend on the circumstances of each case, in particular efforts by the nuclear weapon state prior to its decision to employ nuclear weapons and the reasonableness of its decision.

This chapter shows that the rules of the law of armed conflict that protect the environment during armed conflict may provide additional parameters and significant impediments for a nuclear weapon state to employ nuclear weapons. These parameters have materialised over the last twenty to thirty years and reflect growing concern for environmental protection. Such protection is not only in the interest of all states, but also in the interest of mankind.⁷⁹ After all, 'the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn.'⁸⁰

⁷⁹ *Gabčíkovo-Nagymaros* case, para. 53: 'The Court recalls that it has recently had occasion to stress ... the great significance that it attaches to respect for the environment, not only for States but also for the whole of mankind.'

⁸⁰ Nuclear Weapons Advisory Opinion, para. 29.