

Does the laws of armed conflict adequate enough to protect the environment during of the international armed conflict? A legal critique

Md. Zubair Kasem KHAN¹

Abstract

It is an undeniable fact that, environment annihilation and the armed conflicts are like two sides of the same coin and thus can no way be averted the former effects in case of the existence of later cause. Out of this realisation, a number of International Conventions and International Humanitarian laws have developed over times to protect or reduce environment destructions during warfare. Hence, this paper has penned to weigh up carpingly the adequacy and efficacy of the laws of armed conflicts for safeguarding the environment from possible annihilations that occur during warfare of international character. Further to note that, the present paper will not focus on provisions pertaining to environmental protections during war, under international legal instruments that deals with arms limitation, arms proliferation or any other laws addressing jus ad bellum. In other words, the current study will restrict itself to examine only the protection of environment in jus in bello of international character.

Keywords: *Laws of Armed Conflict (LOAC), Additional Protocol-I, the ENMOD Convention Environment Protection.*

JEL Classification: K32, K33.

1. Introduction

[T]he environment is under daily threat and... that 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.²

This statement was promulgated by the International Court of Justice through its advisory opinion published on 8 July of 1996, in relation to the legality of the threat or use of nuclear weapons and their destructive effects on the humanity and the environment. Truly speaking, this realization is spot on not only in the case of using nuclear weapons but also all other chemicals and biological weapons, including some sophisticated conventional weapons used in the history of warfare in the globe. In fact, armed conflicts and its consequential harmful effects on the

¹ Zubair Kasem Khan – LL. B(Hons), MCL(Malaysia), LLM(UK). Lecturer of Law, Bangladesh University, Dhaka, Bangladesh. Former Graduate Research Fellow, IIUM, Malaysia, zubair.rumi505@gmail.com.

² *Legality of the Threat or Unse of Nuclear Weapons* (Advisory Opinion) ICJ Report 1996 <<http://www.icj-cij.org/files/case-related/95/095-19960708-ADV-01-00-EN.pdf>> accessed 3 January 2018, 241 (para 29).

environment had also been a great concern to the Rio Declaration on Environment and Development of 1992 and thus adopted principles conferring responsibility to individual States to be obliged by international laws protecting the environment.³

Frankly speaking, the two different words 'environment' and 'armed conflict' are inextricably wired both in subjective and objective angles.⁴ The ratiocination behind this statement is also genuine and obvious. On the one hand, the environment is always being the immediate casualty of every kinds of armed conflicts, while, on the other hand, decayed environment and 'unsustainable use of natural resources' sometimes play as leavening role in yielding and aggravating international armed conflict between States.⁵ A third possible dimensional cause for constituting relationship between the two is that, environment sometimes become the motivator or extender for prolonging armed conflicts and this situation becomes explicit when extortion, extraction and commercialization of natural resources are the central and conspicuous to the conflicts.⁶ Be that as it may, regardless of the purposes for constituting any armed conflict, it always have direct and immediate vicious impacts on the environment over the targeted or conflicted places, as well as, indirect long term effects on the global climate system.

Pondering upon the gravity and mass destructions of warfare during the conflict or aftermath, the means and methods of warfare are being modernized tremendously with the simultaneous advancement of science and technology nowadays. In this upshot, unlike the 17th or 18th centuries of conventional warfare and their aftermaths, the totality of contemporary armed conflicts does not confine into human miseries only; mass destructions of home, infrastructures and forests are just some usual and unavoidable ensuing victims of the warfare. Not only that, armed conflict compels both civilians and combatants to undergo expatriation or deportation and this has evidenced many a times in the recent history of war.⁷

Alarming to note that, armed conflicts always have parallel immediate and in most of the cases, long-term dreadful effects and degradations on environment. In some recent past cases, the armed conflicts of international character have been occurred by exercising sophisticated atomic ammunitions and the effects of these conflicts are so gruesome in the point that, the aftermaths of the attacks stretched out beyond the territory of the targeted zones and caused sudden annihilation of all the

³ United Nations Conference on Environment and Development, 'Rio Declaration on Environment and Development' UN Doc. A/CONF.151/26 (vol. I); 31 ILM 874 (1992) ((Rio de Janeiro, 3-14 June 1992), Principle- 24.

⁴ Michael N. Schmitt, 'Green War: An Assessment of the Environmental Law of International Armed Conflict' (1997) 22(1) Yale Journal of International Law 1.

⁵ Santosh Upadhyay, 'Armed Conflict and the Environment' (2013) 23(1) Yearbook of International Environmental Law 217-224.

⁶ Philippe Le Billon, 'The Political Ecology of War: Natural Resources and Armed Conflicts' (2001) 20 Political Geography 561-584. See also: Philippe Le Billon, *Fuelling War: Natural Resources and Armed Conflict* (Routledge 2005) 29-50.

⁷ David Jensen and Silja Halle (ed.) *Protecting the Environment During Armed Conflict, An Inventory and Analysis of International Law* (United Nations Environment Programme 2009) 8.

elements, living or non-living whatsoever, even if survived, sustained with radiation poisoning, thyroid, breast and many other types of cancers for rest of their life. Not only that, some heavy ammunitions like: hydrogen bomb, nuclear bomb etc. also bring about global fallout due to the injection of radioactive particles into the stratosphere and this had been experienced by the world during the World War-II, when the US threw two uranium bombs over Hiroshima on 6 August 1945 and Nagasaki on 9 August 1945 in Japan respectively.⁸ A recent environmental research on ‘Impact of Nuclear Weapons Use on Climate And Agriculture’⁹ conducted by the International Red Cross has revealed a terrifying information on how nuclear weapons could destructively effects on our environment and climate systems. According to this research, the upshot of a ‘limited’ nuclear war engaging 100 Hiroshima-sized ammunitions could produce 5 million tonnes of soot that possibly loft into from the urban and industrial firestorms and cover the upper atmosphere.¹⁰ This could ultimately cause a decline of global temperature up to 1.3°C for several years and thus capable of collapsing the present global climate, ecological and agricultural systems.¹¹

To save the world from this kind of possible destructive upshots that caused during armed conflicts, international community have taken a number of initiatives since the beginning of last century, with the intention to hedge combatants from

⁸ *Ibid.* This had been manifested to the whole world when the United States threw down a uranium bomb over Hiroshima on 6 August 1945 and dropped further a plutonium bomb three days later over another city called Nagasaki in Japan. Even though, the accurate death toll of the 1945 atomic bombings of Hiroshima and Nagasaki is still obscure to the world, majority of reports estimated that the combined death caused was between 129,000-240,000 (nearly 70,000 civilians had died in 9 seconds due to the overheating of nuclear explosion reached up to 7200 degrees Fahrenheit. For more information, The International Campaign to Abolish Nuclear Weapons (ICAN), ‘Hiroshima and Nagasaki Bombings’ <<http://www.icanw.org/the-facts/catastrophic-harm/hiroshima-and-nagasaki-bombings/>> accessed 03 January 2018. See also: Dr. Mary Dowd, ‘How Nuclear Bombs Affect the Environment’ (*Hearst Seattle Media*) <<http://education.seattlepi.com/nuclear-bombs-affect-environment-6173.html>> accessed 03 January 2018; Lincoln Riddle, ‘The Lasting Effects of the Atomic Bombing of Hiroshima and Nagasaki’ (*War History Online*, 02 May 2016) <<http://www.warhistoryonline.com/war-articles/d-day-soldier-honored-locals-helped-liberate.html>> accessed 03 January 2018; SJ Environmental Justice, ‘Atomic Bombing of Hiroshima and Nagasaki’ <<http://www.sjenvironmentaljustice.org/atomic-bombing-of-hiroshima-and-nagasaki/>> accessed 03 January 2018.

⁹ International Committee of the Red Cross, ‘Climate Effects of Nuclear War and Implications for Global Food Production’ (ICRC, 22 May 2013) <<https://www.icrc.org/eng/assets/files/2013/4132-2-nuclear-weapons-global-food-production-2013.pdf>> accessed 03 January 2018. See also: Campaign for Nuclear Disarmament, ‘The Effects of Nuclear Weapons’ <<http://www.cnduk.org/campaigns/global-abolition/effects-of-nuclear-weapons>> accessed 03 January 2018.

¹⁰ Owen B. Toon, Richard P. Turco, Alan Robock, Charles Bardeen, Luke Oman and Georgiy L. Stenchikov, ‘Atmospheric Effects and Societal Consequences of Regional Scale Nuclear Conflicts and Acts of Individual Nuclear Terrorism’, (2007) 7 *Atmospheric Chemistry and Physics*, 1973–2002.

¹¹ Alan Robock, Luke Oman, Georgiy L. Stenchikov, Owen B. Toon, Charles Bardeen and Richard P. Turco, ‘Climatic Consequences of Regional Nuclear Conflicts’ (2007) 7 *Atmospheric Chemistry and Physics*, 2003-2012.

unnecessary injury, non-combatants casualty and protection from environmental destructions.¹² Thus, the present paper has attempted to make a critical evaluation about the adequacy of all existing humanitarian laws that ensure environment protection during international armed conflicts. However, the present paper will not focus on provisions pertaining to all environmental protections under international legal instruments that deals with arms limitation, arms proliferation or any other laws addressing *jus ad bellum*. It will rather examine all protections of environment in *jus in bello* of international character.

Part I of this paper will restrict into by highlighting and scrutinizing rigorously the two relevant instruments that have adopted with the aspiration to conserve the environment during international armed conflicts. This paper will attempt to find the loopholes or controversies that exist within these two instruments, for protecting the environment. Part II of this paper will look at some other legal instruments that indirectly/partially helps in protecting the environment from unnecessary annihilations, that caused during international armed conflicts. Part III will explain two historically notorious international armed conflicts that caused unprecedented environmental destructions during war and examine whether the existing LOAC were sufficient enough to protect environment from such war destructions. Undoubtedly this is an important part for making a comprehensive legal analysis and thus could help readers to anatomize and analyse the effectiveness and application of two IHL during warfare and its legal responses thereto for protecting the environment. Part-IV will conclude the paper by proposing three recommendations as to how can these legal shortfalls, as found in the first part, be remedied.

2. Protections of environment under the Laws of Armed Conflict (LOAC)

Perhaps the fundamental and extensive body of laws that ensure environmental protections during armed conflicts is the IHL¹³, which by character does not deal with conflicts like isolated violence or internal domestic disturbance within a State. Thus, this body of laws starts its enforcement only when contest stated

¹² Yoram Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict* (2nd edn, Cambridge University Press 2010) 16-20. See also: Arie Afriansyah, 'The Adequacy of International Legal Obligations for Environmental Protection During Armed Conflict' (2013) 3(1) *Indonesia Law Review* 55-96, 55.

¹³ The four Geneva Conventions and three Additional Protocols are considered as the central body of laws of international humanitarian laws governing and regulating the conduct of warfare during hostilities, securing protections for the environment, public health and endeavouring the limits of the effects of and during the armed conflicts.

between two parties by using armed force, in which one side must be a regular military belonging to a sovereign State.¹⁴

A number of jurists have eyed up thoroughly to evaluate the adequacy of protecting the environment under IHL during armed conflicts of international character.¹⁵ Apart from *jus cogens* norms, most of the scholars have classified the IHL into two subheadings: 1) Direct instruments addressing environmental protections and 2) Indirect instruments addressing environment protections and the laws of armed conflict fall under the former one. Hence, the following part of the current discussion will highlight mainly the direct treaty-laws that are in force to protect the environment during international warfare. There are two vital legal instruments in this respect, one is engendered through the United Nations procedure and another underneath the 'Red Cross law'.

(i) ***Environmental protection under Additional Protocol I to the 1949 Geneva***¹⁶. The Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) was adopted in 1977 by the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law applicable in Armed Conflicts (Geneva, 1974-77) that is convened by the ICRC.¹⁷ Article 35(3) and 55(1) of the Protocol- I are the core provisions that provide direct protections against environmental annihilations during international armed conflicts.¹⁸ Furthermore, these two provisions are the first internationally adopted binding rules that confer direct environmental protections by expressly debarring environment to be the specific and direct military target by combatant during hostility.¹⁹ Art. 35(3) of the Protocol- I proclaims the basic rules which reads as- '*It is prohibited to employ*

¹⁴ Uppsala Conflict Data Program (UCDP), 'Definitions, sources and methods for Uppsala Conflict Data Program Battle-Death estimates' <<http://ucdp.uu.se/downloads/old/brd/ucdp-brd-conf-41-2006.pdf>> accessed 05 January 2018.

¹⁵ Michael Bothe, 'The protection of the environment in times of armed conflict' (1991) 34 German Yearbook of International Law 54- 62. See also: Richard G. Tarasofsk, 'Legal Protection of the Environment During International Armed Conflict' (1993) XXIV Netherlands Yearbook of International Law 17- 79; Jay E. Austin and Carl E. Bruch (eds), *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives* (Cambridge University Press 2000); United Nations Environment Programme (UNEP), *Protecting the Environment During Armed Conflict: An Inventory and Analysis of International Law* (United Nations Environment Programme 2009); Michael Bothe and others, 'International law protecting the environment during armed conflict: gaps and opportunities' (September 2010) 92 (879) International Review of the Red Cross 569- 592.

¹⁶ International Committee of the Red Cross (ICRC), *Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Additional Protocol I)*, (adopted 8 June 1977 and entered into force 7 December 1978) 1125 UNTS 3.

¹⁷ International Committee of the Red Cross (ICRC), 'The Protocols Additional to the Geneva Conventions of 12 August 1949' (04 October 2010), <https://www.icrc.org/en/publication/0321-protocols-additional-geneva-conventions-12-august-1949> accessed 05 January 2018.

¹⁸ Afriansyah (n 12) 62.

¹⁹ *Ibid.*

methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment'.²⁰

Art. 55(1) of the Protocol -I further states that-*'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*'.²¹

Even though, both provisions are complementary in nature and thus interlinked, the perception for justifying this varies indeed. To illustrate, Art. 35(3) provides environment protection by delimiting the methods and means of warfare, whereas Art. 55(1) defends environment from destructions of warfare, by way of protecting the civilians and civilian objects.²² However, both provisions retain resembling standards to bring up the effectiveness of the Protocol-I.²³ Correspondingly, the subsistence of Arts. 35(3) and 55(1) also standardize the Protocol- I into an "intrinsic value plus"²⁴ level as both provisions represent equal importance for the anthropocentric and biotope protections, even though, the United Kingdom was of opinion that, Art. 35(3) is nothing but a 'repetition' of the current Art. 55 and thus should be excluded from this article during the adoption of the Protocol-I. ²⁵ To illustrate, the symmetrical coherence among these two provisions can be found in a way that, in one hand Art. 35(3) of the Protocol- I deals with human variables, while on the other hand, Art. 55 revolves about the war casualties that 'prejudice [to] the health or survival of the population', which is absolutely a traditional anthropocentric formulation.²⁶ In regard to justifying the biotope rationales, Art. 55(1) clearly concentrate on protecting civilian population, whereas, Art. 35(3) simply prohibits suffering of supererogatory character. However, this provision does not deliberately mention about the notion and the target point of the sufferings it indicates. Interestingly, the ICRC's Commentary has attempted to clarify the existing ambiguity on this matter by alluding that Art. 35(3): *[...]is a matter not only of protecting the natural environment against the use of weapons or techniques deliberately directed against it, nor merely of protecting the population*

²⁰ ICRC (n 16) Additional Protocol I.

²¹ *Ibid.*

²² Schmitt (n. 4) 70.

²³ Merrit P. Drucker, 'The Military Commander's Responsibility for the Environment' (1989) 11(2) Environmental Ethics 135, 148-149.

²⁴ Schmitt (n. 4) 70-71.

²⁵ *Ibid.* See also: Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts, Geneva (1974 -1977) Volume VI, <https://www.loc.gov/frd/Military_Law/pdf/RC-records_Vol-6.pdf> accessed 7 January 2018, 118.

²⁶ Schmitt (n. 4) 70-71.

and the combatants of the countries at war against any of these effects, but also one of protecting the natural environment itself...²⁷

This ultimately meant that, if Art. 35(3) chew on ‘unnecessary suffering’, then this suffering does not exhaustively confine into humans only, but also extends its boundary into ‘sufferings’ of the environment.²⁸

Controversies/Criticisms of Additional Protocol-I of 1977. Apart from significance of these two provisions with regards to protecting the environment during war, the provisions also create considerable debates due to two main points, firstly, lack of contextual harmonization and other is the threshold question.

To begin with finding the textual contentions within the provisions firstly, the annexation of a verb ‘includes’ and the rider ‘*thereby to prejudice the health or survival of the population*’ in the second line of Art. 55(1) create confusions. Regarding the former one i.e. the phrasing ‘includes’ within the text of Art. 55(1) entails that, all the interdictions that have expressed under this provision as measures of environmental protection, are no longer a part of the definition or explanation of the preceding sentence and thus becomes an example for the ambit of application for the current provision.²⁹ Likewise, the later statement that stated in the same provision plausibly narrow down its arenas for constituting environmental damages that particularly inimical to the human health or survival only.³⁰ Furthermore, this statement also creates a contrasting situation between two provisions from ideological standpoint i.e., in one hand, Art. 35(3) ended up with the advocacy for unconditional and absolute environmental protection during warfare, whereas, on the other hand, Art. 55(1) has been expressly mentioned that, the environmental protections has been contemplated with the aspiration to guarantee the human health or survival.³¹ However, some jurists are of opinion that, to avoid this controversy, human sufferings ought not to be considered as the crux parameter for imposing injunctions against environmental degradation, rather be regarded as one of the eminent categories within the large injunction rim.³²

However, the pivotal drawbacks that exist within these two provisions is the thresholds meaning of the three crux conditions affixed with the embargo of

²⁷ Yves Sandoz, Christophe Swinarski and Bruno Zimmermann (eds), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (International Committee of the Red Cross, Martinus Nijhoff Publishers 1987) para, 1441, 410.

²⁸ Schmitt (n. 4) 71.

²⁹ Rauch E., *The Protocol Additional to the Geneva Conventions for the Protection of Victims of International Armed Conflicts and the United Nations Conventions on the Law of the Sea: Repercussions on the Law of Naval Warfare* (Berlin 1984) 140.

³⁰ Yoram Dinstein, ‘Protection of Environment in the International Armed Conflict’ (2001) 5 Max Planck Yearbook of United Nations Law 523-549, 531.

³¹ *Ibid.* See also: Geza Herczegh, ‘La Protection de l’Environnement Naturel et le Droit Humanitaire’, in Swinarski, C. (ed.) *Studies and Essays on International Humanitarian Law and Red Cross Principles in Honour of Jean Pictet* (ICRC, Martinus Nijhoff Publishers 1984) 729- 730.

³² *Ibid.* See also: Hans Blix, ‘Arms Control Treaties Aimed at Reducing the Military Impact on the Environment’, in Jerzy Makarczyk (ed.), *Essays in International Law in Honour of Judge Manfred Lachs* (BRILL Publisher 1984) 703, 713.

‘widespread, long-term and severe’ damage to the environment.³³ The co-existence of these three conditions makes Protocol-I’s application and effectiveness so narrow due to the reasons of their cumulative prohibitive character and their interpretation.³⁴ This eventually makes the thresholds not only ambiguous but also unrealistic. In fact, pondering upon the aspiration of the negotiating history, it manifests almost impossible that the threshold requirements could be fulfilled for a conventional warfare, opined by majority of the environmentalists.³⁵

Considering further the negotiation history of the adoption of Protocol-I, it is apparent that the delegates were not quite sure about the phrases, they have inserted to mean under these provisions and their scopes as well.³⁶ Be that as it may, the three conditions stated under this Protocol-I indicated the three cardinal scopes: (i) the areas being invaded during war (widespread), (ii) the time span of the war (long-term) and (iii) the extent of the damage occurred (severe). Astoundingly, no consensus had been made among the negotiating delegates in clarifying the meanings of each of these terminologies, which in reality, tarnishes the effectiveness of the provisions during war. Some had considered that, the term ‘long-term’ as ‘period measured in decades’³⁷, while other compared the duration with the ‘battlefield destruction that occurred in France’³⁸ during the WW-I, which is simply vague to be considered for now.³⁹

However, efforts have made by different people to overcome the controversies that laid in the present threshold conditions and among these, the noteworthy contribution has made by the United States Army Judge Advocate General School. In their *Operational Law Handbook*, the terms ‘long-standing’ has been proposed to be understood as decades; ‘Widespread’ stands for ‘several hundred square kilometres...’ and ‘Severe’ has been explained in line with the Art. 55’s rider which indicates any action that- ‘prejudice the health or survival of the population’.⁴⁰ This explanation could definitely help the readers to understand the threshold meaning of Art. 35(3).

³³ ICRC (n 16) Additional Protocol I, Arts. 35(3) and 55(1).

³⁴ *Ibid* (n 15) Bothe and others, ‘International law protecting the environment during armed conflict: gaps and opportunities’ 575.

³⁵ *Ibid* 576. See also: Waldemar A. Solf, ‘Article 55: protection of the natural environment’, in Michael Bothe, Karl Josef Partsch and Waldemar A. Solf, *New Rules for Victims of Armed Conflict: Commentaries on the Two 1977 Protocols Additional to the Geneva Conventions of 1949* (Martinus Nijhoff Publishers 1982) 348. Michael N. Schmitt, ‘War and the Environment: Fault Lines in the Prescriptive Landscape’ (1999) 37(1) *Archiv des Völkerrechts* 43-44.

³⁶ Schmitt (n 4) 72.

³⁷ Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts, Geneva (1974 -1977) Volume XV, <http://www.loc.gov/rr/frd/Military_Law/pdf/RC-records_Vol-15.pdf> accessed 7 January 2018, CDDH/215/Rev.1, para. 27.

³⁸ *Ibid*.

³⁹ Schmitt (n 4) 72.

⁴⁰ *Operational Law Handbook*, ‘International and Operational Law Department the Judge Advocate General’s Legal Center & School, U.S. Army Charlottesville (17th edn, Virginia 2017) 350.

Other indirect protections against environmental destruction. While Arts 35(3) and 55(1) represent the cardinal or direct protections against environmental destructions by or during armed conflicts in Protocol I, these are not conclusive. Further, sundry of other provisions under the present Protocol-I, that also indirectly exhibits the issues of warfare and its environmental destructions in consequence. For instance, Art 35(1) precludes parties unlimited jurisdiction to employ methods and ammunitions during warfare, while 35(2) prohibits parties to apply any kind of weapons that incline ‘superfluous injury or unnecessary suffering’⁴¹. Even though, both provisions are the basic rules particularly dedicated to reducing human sufferings, these also play a role to protect environment in a faintly way.

Another relatively important provision, prescribing injunction against indiscriminate attacks which denotes- ‘those which employ a method or means of combat the effects of which cannot be limited as required by this Protocol’.⁴² Moreover, both Arts 51(5)(b) and 57(2)(b) of the Protocol- I expressly mentioned that, an attack is to be considered as indiscriminate, if it is predicted that such attack brings about damaging the civilian objects which, in fact, is not in proportionate to the direct military advantage, shall be cancelled. These two provisions mandate ‘proportionality experiment’⁴³ and thus interlinked with environmental protection as because indiscriminate attacks always cause unnecessary destructions, which in the long run threaten the environment as well.⁴⁴ Furthermore, insertion of requirements under Arts. 48 and 52(2) of the Protocol- I, addressing to distinguish between civilian and military objects is also pertinent in respect to examine the principles of ‘military necessity’ and ‘proportionality’⁴⁵ analysis, which indirectly interdict militants of both parties to attack and damage environment.

Protocol- I also ensures indirect environmental protections by prohibiting certain conducts such as- ‘attack, destroy, remove or render’ of any objects that is essential for the survival of the civilian population at large.⁴⁶ Noteworthy the list of objects⁴⁷ that has expressed in this provision as example, unanimously indicates the environment protection, as all these are the crucial elements of the environment.⁴⁸ Even, the list of ‘useless objects’ is not exhaustive and thus includes fuel oil, electricity or any other means of natural resources indispensable to human survival and the absence of this provisions could ultimately leads to environmental ruination.⁴⁹ A similar provision of safeguarding environment from armed conflicts

⁴¹ ICRC (n 16) Additional Protocol I, Art. 31(2).

⁴² ICRC (n 16) Additional Protocol I, Art. 51(4)(c).

⁴³ Schmitt (n. 4) 76.

⁴⁴ Afriansyah (n. 12) 64.

⁴⁵ Schmitt (n. 4) 77.

⁴⁶ ICRC (n. 16) Additional Protocol I, Art. 54(2).

⁴⁷ Objects including but not limited to ‘[...]foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works...’. See: ICRC (n. 16) Protocol I, Art. 54(2).

⁴⁸ Schmitt (n. 4) 76. See also: Tarasofsk (n. 15) 52 and Afriansyah (n. 12) 65.

⁴⁹ *Ibid.*

is Art. 56(1), whereby the ‘nuclear electrical generating stations, dams and dykes’⁵⁰ are being considered as immune from armed attack, however, such protection can be ceased if these three elements are considered as the ‘regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support’.⁵¹ Another way of immunising certain areas of land including surrounding environment from armed attack during war is, by way of creating ‘special protected zones’,⁵² which can be done either by declaring ‘non-defended localities’⁵³ or ‘demilitarized zones’⁵⁴. The former category is a conditional⁵⁵ way of safeguarding environment which can be formulated either by unilaterally or by agreement between the belligerents.⁵⁶ However, the latter category is quite strict to develop, which requires unanimity between all belligerents.⁵⁷ Last but not least, the Martens Clause that stated in Art. 1(2)⁵⁸ is always in action to find the general solution of a problem relating to environmental protection in which, the Protocol or four Geneva Conventions fails to do so.⁵⁹

(ii) Environmental Protection under The ENMOD Convention of 1977⁶⁰.

The United Nations has adopted the Convention on the Prohibition of Military or Other Hostile Use of Environmental Techniques (hereafter, ENMOD) in the year 1977 which came into force on 5 October 1978. Basically, this convention was adopted as the first international treaty, with the aim to stop allowing the belligerents to use cataclysmic environmental changes as a means or methods of war during hostility.⁶¹

The ENMOD is by nature, ‘Hague Law’ in the sense that, it governs the war law by limiting the methods and means of warfare and thus the object point of this provision is not to evaluate whether environment is being affected by weapons during war or not, but to prohibit environment as methods and means of war.⁶² The basic provisions of the Convention for protecting the environment is stated in Art I(1), which states: *Each State Party to this Convention undertakes not to engage in*

⁵⁰ ICRC (n 16) Additional Protocol I, Art. 56(1).

⁵¹ ICRC (n 16) Additional Protocol I, Art. 56(2).

⁵² Tarasofsk (n 15) 53 and Afriansyah (n 12) 65.

⁵³ ICRC (n 16) Additional Protocol I, Art. 59.

⁵⁴ ICRC (n 16) Additional Protocol I, Art. 60.

⁵⁵ ICRC (n 16) Additional Protocol I, Art. 59 (2).

⁵⁶ Tarasofsk (n 15) 53.

⁵⁷ *Ibid.*

⁵⁸ ICRC (n 16) Additional Protocol I, Art. 1(2). This article reads as: ‘In cases not covered by this Protocol or by other international agreements, civilians and combatants remain under the protection and authority of the principles of international law derived from established custom, from the principles of humanity and from the dictates of public conscience.’

⁵⁹ Schmitt (n 4) 77. See also: Tarasofsk (n 15) 35.

⁶⁰ Convention on the Prohibition of Military or Other Hostile Use of Environmental Techniques (ENMOD) (adopted on 10 December 1976, 5 October 1978) 1108 UNTS 151.

⁶¹ Liesbeth Lijnzaad and Gerard J. Tanja, ‘Protection of the Environment in Times of Armed Conflict: The Iraq-Kuwait War’ (1993) 40 *Netherlands International Law Review* 169, 186.

⁶² Schmitt (n 4) 77.

*military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party.*⁶³

However, the nub obligation, as stated under Art. 1(1), has been delivered in the definition of the ‘environmental modification techniques’ under Art. II. According to Art II of the ENMOD of 1977, ‘*environmental modification techniques*’ connotes- ‘*any technique for changing -- through the deliberate manipulation of natural processes -- the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space*’.⁶⁴

Controversies/Criticisms of the ENMOD of 1977. No doubt, the ENMOD of 1977 is one of the important innovations for governing the warfare by examining and approving what sorts of techniques and weapons that can be used during armed conflict, however, the current convention could not go beyond the criticisms. Firstly, the resembling wordings ‘widespread, long-lasting or severe’ that also found in Protocol- I as conditional criteria, has also been repeated in Art. I with a slight conjunctive alternative ‘or’ instead of ‘and’. These ostensible textual similitudes between two provisions of different instruments are somehow deceptive due to two main grounds:

Firstly: in case of the ENMOD, the terms are used as alternative (‘widespread, long-lasting *or* severe’) conditions to be fulfilled whereas they are enumerated cumulatively (‘widespread, long-term *and* severe’) in the Protocol-I. This means that, fulfilment of one of the three yardsticks is good enough to apply the ENMOD against environmental destruction whereas, a concurrent three conditions must be fulfilled in case of Protocol-I and thus the ENMOD have low threshold condition compared to the Protocol-I in case of applying this as a claim for environmental damage during war.⁶⁵

Secondly: apart from linguistic conjunctive and disjunctive debates, the two international instruments (i.e.: the ENMOD and the Protocol-I) also possess different meaning of the identical terminologies.⁶⁶ For instance, considering the threshold criteria of the ENMOD, according to the ‘Understanding Relating to Article I’⁶⁷, ‘Widespread’ was interpreted as ‘encompassing an area on the scale of several

⁶³ The ENMOD, Art. I(1).

⁶⁴ The ENMOD, Art. II.

⁶⁵ J. de Preux, ‘Article 35’, in Yves Sandoz and others (eds), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (International Committee of the Red Cross, Martinus Nijhoff Publishers 1987) 419. See also: Schmitt (n 4) 43-44.

⁶⁶ Antoine Bouvier, ‘Protection of the natural environment in time of armed conflict’ (1991) 31 *International Review of the Red Cross* 567, 575-576.

⁶⁷ A report called ‘Conference of The Committee on Disarmament’ was published by the General Assembly of the United Nations during the ENMAD, intending to clarify the terminologies that used in the Convention. See also: The United Nations, *Understanding Relating to Article I, Report of the Conference of the Committee on Disarmament*, UNGA OR (1976), 31st Session, Supplement No 27 (U.N. Doc. A/31/27) 91-92.

hundred kilometres'; 'Long-lasting' as 'lasting for a period of months, or approximately a season; and 'Severe' as 'involving serious or significant disruption or harm to human life, natural and economic resources or other assets'.⁶⁸ Even though, the first two criteria was determined in a quite easier and sensible quantitative measurement scale, ambiguity exists in the third definition.⁶⁹ In particular, interpretation of 'Severe' as 'serious and significant' seems too strengthen protection compared to the Protocol-I and thus nearly impossible to proof in case of environmental destruction.⁷⁰

Another discrepancy exists in the definition of Art. II, in the phrasing of 'environmental modification technique'. Even though, an open-ended example of this terminologies has been delivered in the Understanding Relating to Article I⁷¹, it seems that the definition is not sufficient enough to cover all the methods of wars that involves 'manipulation of natural processes'.⁷² This weakness ultimately leads the instrument, failed to take charge against Iraq during Gulf War.⁷³

3. Supplementary international instruments for protecting environment

Apart from the abovementioned Protocol-I and the ENMOD, there are some international instruments which also provide indirect protections against environmental annihilations during war. Some of these international legal instruments are providing environmental protections by dealing with arms limitation, arms proliferation or any other laws addressing *jus ad bellum*. For instance, 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 (CCW), and its Protocol III on Prohibitions or Restrictions on the Use of Incendiary Weapons (1980). While the Preamble expresses the same three threshold test criteria for using the weapons, Article 2(4) of the CCW particularly interdict belligerents to employ any Incendiary Weapons that causes harm to the environment. Likewise, the Chemical Weapons Conventions (CWC) was adopted in January 1993 which prohibits combatants to employ or spray any chemicals that have direct effects on human health and the environment. Further, the 1998 International Criminal Court Statute (Rome Statute) also provides some indirect environmental protections under Art. 8(2).

⁶⁸ *Ibid.*

⁶⁹ A.S. Krass, 'The Environmental Modification Convention of 1977: The Question of Verification' in A. H. Westing (ed), *Environmental Warfare: A Technical, Legal and Policy Appraisal* (Taylor & Francis 1984) 67.

⁷⁰ Schmitt (n 4) 83.

⁷¹ *Ibid* (n 66).

⁷² Schmitt (n 4) 84.

⁷³ *Ibid.*

4. Historical and legal observation of international armed conflicts

Case Study 1: The Gulf War of 1990-1991. A deliberate environmental destruction had been occurred during the Gulf War of 1990-1991 when Iraq viciously released unimaginable quantities of oil into the Persian Gulf and which engendered the ‘the largest oil spill ever’ in the history.⁷⁴ According to the reports, it was estimated that more than 11 million barrels of oil was spilled into the Gulf sea by 25 January 1991 and by mid-February, the estimated amount of oil that was poured into the Gulf by the Iraqi militia was between 6 and 9 million barrels of crude.⁷⁵ Correspondingly, more than 400 kilometres of the Saudi and the southern part of Kuwaiti coasts were drastically affected by slicks, caused died of more than 30,000 of marine birds and enormous number of sea fishes during this Gulf conflict.⁷⁶ It is further important to note that, almost 613 wells of oil were burned, others 175 were left gushing or depreciated during February, 1991. The whole destruction was so massive that it took almost 10 months to extinguish the fire of wells.⁷⁷

Coming to the legal point, even if it is accepted for argument that, the oil well was military objectives, the amount of smokes and their monstrous environmental destructions that created from the burning of oils, were far more than the counter-arguments of advantage of screen reducing visibility that Iraqi soldiers raised. This undoubtedly breaches the principles of proportionality during hostility.⁷⁸ Most importantly, due to the grave environmental destructions done by way of burning the oils in Kuwait, still the Iraq could not be liable for breaching the provisions of Additional Protocol-I and the ENMOD as Iraq was not the party to these instruments. Even if, Iraq was considered as a party to the Protocol-I, still the destruction could not satisfy the cumulative three-threshold criteria test (‘widespread, long-term and severe’), as the destruction was not long-term (measured in decades).

This has also been acknowledged in the reports of the US Defense Office after investigating Gulf War.⁷⁹ Considering the ENMOD, it is of unanimity that, the atrocities that had been done by Iraq soldiers to Kuwait, ultimately fulfilled the disjunctive three-threshold criteria list (‘widespread, long-lasting or severe’) as

⁷⁴ Adam Roberts, ‘Environmental Issues in International Armed Conflict: The Experience of the 1991 Gulf War’ in R. J. Grunawalth and others (ed) *Protection of the Environment During Armed Conflict* Vol. 69 (International Law Studies 1996) 247.

⁷⁵ *Ibid*, 248.

⁷⁶ *Ibid*.

⁷⁷ Dinstein (n 30) 543.

⁷⁸ *Ibid*, 544.

⁷⁹ ‘United States: Department of Defense Report to Congress on the Conduct of the Persian Gulf War - Appendix on the Role of the Law of War’ (May 1992) 31(3) *International Legal Materials* 612-644, 636.

stated in Art. I.⁸⁰ However, problem lies in the fulfilment of Art. II of the ENMOD as such the techniques that applied by the Iraq did not ‘involve manipulation of natural processes’.⁸¹ The sensible argument in this regard is that- ‘[t]he direct cause of the environmental destruction was that detonation of explosives on the well-heads, and the fact that those well-heads have been constantly supplied with inflammable oil to feed the fire triggered by those explosions by virtue of the pressures in the strata below them is a secondary, not a causative, matter. Explosives, not oil pressure, were manipulated’.⁸²

Case Study 2: The Vietnam War of 1945-1975. Another example of extreme environmental annihilation done by the USA during armed conflict was the Vietnam War. Apart from employing all traditional means of war techniques, like: destroying forests and crops as a denial of the normal survival of Vietnamese, the USA sprayed more than 20 million gallons of Herbicides⁸³ over the Southern parts of Vietnam, targeting to destroy crops (14%) and defoliate forests (86%).⁸⁴ This spraying of Herbicides mixed with Agent Orange caused an approximate death of five million Vietnamese, more than 400,000 disabilities and 0.5 million of Vietnamese were born with birth defects along with the immense environmental impacts.⁸⁵ Even, still lands, woods and agriculture in Vietnam are enduring environmental predicaments due to the excessive chemical reactions that employed during the war.⁸⁶ A similar kind of destructive chemical called Napalm was also employed by the USA military during war which also ceased to exist nearly thousands of acres of forests. All these ultimately affects on ecological system, biodiversity and animal habitats in the long run.⁸⁷

Important to note, after observing mass environmental destructions in Vietnam due to over spraying of Agent Orange and Napalm in one hand, and the public health safety that was under threat due to the exercise of Herbicides on the

⁸⁰ Marc A. Ross, ‘Environmental Warfare and the Persian Gulf War: Possible Remedies to Combat Intentional Destruction of the Environment’ (1992) 10(3) Penn State International Law Review 531.

⁸¹ L. Edgerton, ‘Eco-Terrorist Acts During the Persian Gulf War. Is International Law Sufficient to Hold Iraq Liable?’ (1992) 22 GA. J. INT’L & COMP. L. 172. See also: Dinstein (n 30) 546.

⁸² G. Plant, ‘Introduction’ in G. Plant (ed.), *Environmental Protection and the Law of War: a ‘Fifth Geneva’ Convention on the Protection of the Environment in Time of Armed Conflict* (1992) 3. See also: Dinstein (n 30) 547.

⁸³ In general, ‘Herbicides’ is a kind of chemical substances that is widely used to control unused plants. Agent Orange is one kinds of dioxin-contaminated and extremely harmful Herbicide that was manufactured and sprayed during the Vietnam war. Agent Orange (TCDD) is also one of the top most toxic environmental contaminants which leads to cancer, birth defects and disruptions to the immune and endocrine systems of a human body. See also: H. Patricia Hynes, ‘Chemical Warfare: Agent Orange’ (Thursday, August 11, 2011) <<http://www.truth-out.org/news/item/2592-chemical-warfare-agent-orange>> accessed 15 January 2018).

⁸⁴ General Cao Van Vien and Lt. Gen. Dong Van Khuyen, *Reflections on the Vietnam War* (U.S. Army Center of Military History Indochina Monographs 1980). See also: Schmitt (n 4) 10.

⁸⁵ Laure Verheyen, ‘War’s silent victim: the environment’ (7 May 2017) <http://www.eir.info/2017/05/07/wars-silent-victim-the-environment/#_edn3> accessed 15 January 2018.

⁸⁶ *Ibid.*

⁸⁷ Schmitt (n 4) 10. See also: Richard Carruthers, ‘International Controls on the Impact on the Environment of Wartime Operations’ (1993) 10 Environmental and Planning Law Journal 38, 40.

other hand, the world leaders have come to a collective understanding that, what happened during Vietnam war, should not be repeated. Out of that inclination, the ENMOD and the Additional Protocol- I were developed as key instruments for safeguarding the environment during war. Hence, technically Arts. 35(3) and 55(1) of the Protocol -I and both the Arts. I and II of the ENMOD were not existed during Vietnam War, however, considering the large areas (15,000 sq. km) of land being invaded; the long-lasting aftermath of war destructions and the severity of damage due to spraying of chemicals during Vietnam war could easily be concluded that the three threshold criteria of Art. 35(3), 55(1) and Art. I of the Protocol-I and the ENMOD were fulfilled respectively. Further, the consequence of war to the environment and climate changes also satisfied the requirements of Art. II of the ENMAD, even though some confusions exists in the argument of whether the 'manipulation of natural processes' was in deliberate or collateral in nature.

5. Conclusion

Environment is always existing everywhere, and thus can no way be separated from human life and survival. It is further true that, all kinds of warfare, using conventional or nuclear weapons whatsoever, always bring some tearing down impacts on the environment. Even though, the world has undergone many experiences of environmental annihilations during war, sufficient efforts to immunise environment from and during armed conflicts emerged since late 70 decades of the last century, particularly in response to the Vietnam War, followed by largest oil spilling tragedy that happened during the Gulf War. It is also pertinent to say from the above discussion that, both the Additional Protocol-I to the 1949 Geneva Convention and the Convention on the Prohibition of Military or Other Hostile Use of Environmental Techniques of 1977, represent as outstanding innovations for environmental protections in the international humanitarian law rim for governing the *jus in bello*, even though, these contain numerous ambiguities and confusions. To overcome these burning debates, the current research proposes some recommendations which are:

Firstly, the three-threshold criteria test that is manifested in both the Protocol-I and the ENMOD are unreasonably restrictive, making the injunction considerably narrow from the environmental perspective. Therefore, efforts should be made from international level to overcome this existing three-threshold ambiguity for the effective implementation of these two legal instruments against the belligerent States for environmental destruction during war.

Secondly, it is also seen that the methodical scope of these proscriptions remains dubious and sometimes unclear, and thus create problem to implement or enforce these instruments. Therefore, a separate international tribunal or global monitoring body can be established, whose main goal would be to observe and investigate as to whether any violations of the above mentioned environmental protections occurred by any belligerent State during international armed conflict, and if so be remedied.

Thirdly, both the instruments create perplexity while considering the practical employment or evaluation of the principals of ‘proportionality’ and ‘military necessity’ in regard to environmental destructions during war. This creates doubt in determining about a collateral damage and the damage with deliberate intention. In fact, both the Protocol-I and the ENMOD have failed to ensure adequate protections against some direct environmental destructions that cause by war and thus still permissible and is being practicing in some ongoing war, especially in Iraq and Gaza Strip. Certainly, the United Nations could take initiatives to overcome this abovementioned problem by adopting some explanatory notes to clarify the dubious connotations that exist in these instruments. Finally, more and more initiatives should be taken both from international and domestic rims to increase awareness among public and combatants on how important the environment is for human life and survival and thus should not be a subject to attack during war.

Bibliography

1. Afriansyah A, ‘The Adequacy of International Legal Obligations for Environmental Protection During Armed Conflict’ (2013) 3(1) Indonesia Law Review.
2. Austin J E. and Bruch C E.(eds), *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives* (Cambridge University Press 2000).
3. Billon P L, ‘The Political Ecology of War: Natural Resources and Armed Conflicts’ (2001) 20 Political Geography.
4. Billon P L, *Fuelling War: Natural Resources and Armed Conflict* (Routledge 2005).
5. Blix H, ‘Arms Control Treaties Aimed at Reducing the Military Impact on the Environment’, in Makarczyk J (ed.), *Essays in International Law in Honour of Judge Manfred Lachs* (BRILL Publisher 1984).
6. Bothe M and others, ‘International law protecting the environment during armed conflict: gaps and opportunities’ (September 2010) 92 (879) International Review of the Red Cross.
7. Bothe M, ‘The protection of the environment in times of armed conflict’ (1991) 34 German Yearbook of International Law.
8. Bouvier A, ‘Protection of the natural environment in time of armed conflict’ (1991) 31 International Review of the Red Cross.
9. Campaign for Nuclear Disarmament, ‘The Effects of Nuclear Weapons’ <<http://www.cnduk.org/campaigns/global-abolition/effects-of-nuclear-weapons>> accessed 03 January 2018.
10. Carruthers R, ‘International Controls on the Impact on the Environment of Wartime Operations’ (1993) 10 Environmental and Planning Law Journal.
11. Dinstein Y, ‘Protection of Environment in the International Armed Conflict’ (2001) 5 Max Planck Yearbook of United Nations Law.
12. Dinstein Y, *The Conduct of Hostilities Under the Law of International Armed Conflict* (2nd edn, Cambridge University Press 2010).
13. Dowd D M, ‘How Nuclear Bombs Affect the Environment’ (Hearst Seattle Media) <<http://education.seattlepi.com/nuclear-bombs-affect-environment-6173.html>> accessed 03 January 2018.
14. Drucker M P, ‘The Military Commander’s Responsibility for the Environment’ (1989) 11(2) Environmental Ethics.

15. Edgerton L, 'Eco-Terrorist Acts During the Persian Gulf War. Is International Law Sufficient to Hold Iraq Liable?' (1992) 22 GA. J. INT'L & COMP. L.
16. Herczegh G, 'La Protection de l'Environnement Naturel et le Droit Humanitaire', in Swinarski, C. (ed.) *Studies and Essays on International Humanitarian Law and Red Cross Principles in Honour of Jean Pictet* (ICRC, Martinus Nijhoff Publishers 1984).
17. Hynes H P, 'Chemical Warfare: Agent Orange' (Thursday, August 11, 2011) <<http://www.truth-out.org/news/item/2592-chemical-warfare-agent-orange>> accessed 15 January 2018.
18. International Committee of the Red Cross, 'Climate Effects of Nuclear War and Implications for Global Food Production' (ICRC, 22 May 2013) <<https://www.icrc.org/eng/assets/files/2013/4132-2-nuclear-weapons-global-food-production-2013.pdf>> accessed 03 January 2018.
19. Jensen D and Halle S (ed.) *Protecting the Environment During Armed Conflict, An Inventory and Analysis of International Law* (United Nations Environment Programme 2009).
20. Justice SJ E, 'Atomic Bombing of Hiroshima and Nagasaki' <<http://www.sjenvironmentaljustice.org/atomic-bombing-of-hiroshima-and-nagasaki/>> accessed 03 January 2018.
21. Krass A S, 'The Environmental Modification Convention of 1977: The Question of Verification' in A. H. Westing (ed), *Environmental Warfare: A Technical, Legal and Policy Appraisal* (Taylor & Francis 1984).
22. Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion) ICJ Report 1996 <<http://www.icj-cij.org/files/case-related/95/095-19960708-ADV-01-00-EN.pdf>> accessed 3 January 2018, 241 (para 29).
23. Lijnzaad L and Tanja G J, 'Protection of the Environment in Times of Armed Conflict: The Iraq-Kuwait War' (1993) 40 Netherlands International Law Review.
24. Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts, Geneva (1974 - 1977) Volume VI, <https://www.loc.gov/rr/frd/Military_Law/pdf/RC-records_Vol-6.pdf> accessed 7 January 2018.
25. Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts, Geneva (1974 - 1977) Volume XV <http://www.loc.gov/rr/frd/Military_Law/pdf/RC-records_Vol-15.pdf> accessed 7 January 2018, CDDH/215/Rev.1 (para. 27).
26. Operational Law Handbook, *International and Operational Law Department The Judge Advocate General's Legal Center & School, U.S. Army Charlottesville* (17th edn, Virginia 2017).
27. Plant G, 'Introduction' in Plant G. (ed.), *Environmental Protection and the Law of War: a 'Fifth Geneva' Convention on the Protection of the Environment in Time of Armed Conflict* (1992).
28. Preux J. de, 'Article 35', in Sandoz Y and others (eds), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (International Committee of the Red Cross, Martinus Nijhoff Publishers 1987).
29. Rauch E, *The Protocol Additional to the Geneva Conventions for the Protection of Victims of International Armed Conflicts and the United Nations Conventions on the Law of the Sea: Repercussions on the Law of Naval Warfare* (Berlin 1984).
30. Riddle L, 'The Lasting Effects of the Atomic Bombing of Hiroshima and Nagasaki' (War History Online, 02 May 2016) <<http://www.warhistoryonline.com/war->

- articles/d-day-soldier-honored-locals-helped-liberate.html> accessed 03 January 2018.
31. Roberts A, 'Environmental Issues in International Armed Conflict: The Experience of the 1991 Gulf War' in Grunawalth R J and others (ed) *Protection of the Environment During Armed Conflict*, Vol. 69 (International Law Studies 1996).
 32. Robock A, Oman L, Stenchikov G L, Toon O B, Bardeen C and Turco R P, 'Climatic Consequences of Regional Nuclear Conflicts' (2007) 7 *Atmospheric Chemistry and Physics*.
 33. Ross M A, 'Environmental Warfare and the Persian Gulf War: Possible Remedies to Combat Intentional Destruction of the Environment' (1992) 10(3) *Penn State International Law Review*.
 34. Sandoz Y, Swinarski C and Zimmermann B (eds), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (International Committee of the Red Cross, Martinus Nijhoff Publishers 1987).
 35. Schmitt M N, 'Green War: An Assessment of the Environmental Law of International Armed Conflict' (1997) 22(1) *Yale Journal of International Law*.
 36. Schmitt M N, 'War and the Environment: Fault Lines in the Prescriptive Landscape' (1999) 37(1) *Archiv des Völkerrechts*.
 37. Solf W A, 'Article 55: protection of the natural environment', in Bothe M, Partsch K J and Solf W A, *New Rules for Victims of Armed Conflict: Commentaries on the Two 1977 Protocols Additional to the Geneva Conventions of 1949* (Martinus Nijhoff Publishers 1982).
 38. Tarasofsk R G, 'Legal Protection of the Environment During International Armed Conflict' (1993) XXIV *Netherlands Yearbook of International Law*.
 39. The International Campaign to Abolish Nuclear Weapons (ICAN), 'Hiroshima and Nagasaki Bombings' <<http://www.icanw.org/the-facts/catastrophic-harm/hiroshima-and-nagasaki-bombings/>> accessed 03 January 2018.
 40. Toon O B, Turco R P, Robock A, Bardeen C, Oman Luke and Stenchikov G L, 'Atmospheric Effects and Societal Consequences of Regional Scale Nuclear Conflicts and Acts of Individual Nuclear Terrorism' (2007) 7 *Atmospheric Chemistry and Physics*.
 41. United Nations Environment Programme (UNEP), *Protecting the Environment During Armed Conflict: An Inventory and Analysis of International Law* (United Nations Environment Programme 2009).
 42. United States: Department of Defense Report to Congress on the Conduct of the Persian Gulf War - Appendix on the Role of the Law of War' (May 1992) 31(3) *International Legal Materials*.
 43. Upadhyay S, 'Armed Conflict and the Environment' (2013) 23(1) *Yearbook of International Environmental Law*.
 44. Uppsala Conflict Data Program (UCDP), 'Definitions, sources and methods for Uppsala Conflict Data Program Battle-Death estimates' <<http://ucdp.uu.se/downloads/old/brd/ucdp-brd-conf-41-2006.pdf>> accessed 05 January 2018.
 45. Verheyen L, 'War's silent victim: the environment' (7 May 2017) <http://www.eir.info/2017/05/07/wars-silent-victim-the-environment/#_edn3> accessed 15 January 2018.
 46. Vien G C V and Khuyen Lt. Gen. D V, *Reflections on the Vietnam War* (U.S. Army Center of Military History Indochina Monographs 1980).