

**From Words to Accountability: Evaluating and Enhancing the
Effectiveness of Legal Frameworks Protecting the
Environment in Armed Conflicts**



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List of Abbreviations

CEPA: Communication, Education and Public Awareness.

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora.

CWC: Chemical Weapons Convention.

ENMOD: The 1976 Convention on the Prohibition of Military or Any Hostile Use of Environmental Modification Techniques.

GHG: Greenhouse Gas.

ICC: International Criminal Court.

ICL: International Criminal Law.

ICRC: International Committee of the Red Cross.

IEL: International Environmental Law.

IHL: International Humanitarian Law.

IHRL: International Human Rights Law.

ILC: International Law Commission.

IPCC: Intergovernmental Panel on Climate Change.

MEA: Multilateral Environmental Agreements.

NGO: Non-Governmental Organization.

NIAC: Non-International Armed Conflict.

NSAG: Non-State Armed Group.

PMC: Private Military Company.

SDS: Sustainable Development Goal.

UN: United Nations.

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0. Chapter Nulla: Introduction of the Thesis

0.1. Abstract

To go straight to the heart of the matter, this thesis puts forward the argument that contemporary international legal frameworks – International Environmental Law, International Humanitarian Law and International Criminal Law [IEL, IHL, and ICL] – are inadequate due to their lack of enforcement mechanisms, accountability structures, and clear standards to address the significant environmental degradation caused by or during armed conflicts.¹ This thesis draws upon case studies, including, the sarin gas attacks in Syria and the Russia-Ukraine conflict, to highlight persistent deficiencies in these frameworks, particularly concerning their inability to address cumulative and indirect impacts on the environment.² To address these shortcomings, this thesis will make a humble attempt to propose a unified and enforceable framework that integrates the three aforementioned fields of law – IEL, IHL, and ICL – drawing on criteria inspired by scholarly contributions, including the work of Baakman on legal effectiveness.³ The overarching objective of this research is to seek options to enhance accountability and improve the practical application of legal protections and enforcement as well in conflict scenarios by prioritizing environmental protection as a fundamental aspect of global conflict resolution.

0.2. Introduction

The Rome Statute (1998) is the foundational document of the International Criminal Court (ICC), which operates within the domain of International Criminal Law (ICL).⁴ In contrast to the other two instruments, the Rome Statute establishes a permanent international judicial body with the authority to prosecute individuals for serious international crimes, including war crimes involving severe environmental damage (Article 8(2)(b)(iv)).⁵ By contrast, the ENMOD Convention, which falls under the jurisdiction of International Environmental Law (IEL), proscribes the use of environmental modification techniques for hostile purposes – such as weather manipulation – when such methods result in widespread, long-lasting, or severe

¹Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 International Review of the Red Cross 605.

²Sommer MQaJ, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 292.

³Baakman K, 'Testing Times: The Effectiveness of Five International Biodiversity-Related Conventions' (Tilburg University 2011).

⁴Rome Statute of the International Criminal Court (adopted 17 July 1998, entered into force 1 July 2002) 2187 UNTS 3, Art.1.

⁵*Idem*.

effects.⁶ The convention is preventative in nature and focused on state compliance, lacking an enforcement body. Meanwhile, Protocol I (1977) to the Geneva Conventions, which is part of International Humanitarian Law (IHL), prohibits methods of warfare that cause significant environmental harm (Articles 35(3) and 55), emphasizing restraint and precaution. It binds states and combatants, but relies on state compliance and lacks a centralized enforcement mechanism.⁷ The fundamental distinction between these legal instruments lies in the ICC's capacity to enforce individual accountability, in contrast to the normative frameworks of ENMOD and Protocol I, which are primarily aimed at states and military conduct, and possess limited enforcement capacity. These instruments were selected based on their formal recognition of environmental harm in wartime situations, as well as their differing legal structures, which include treaty-based prohibitions, criminal accountability and customary humanitarian norms.

0.3. Analytical Problem

Armed conflicts have become a significant driver of environmental degradation, with wide-ranging detrimental consequences for human well-being, ecosystems and biodiversity.⁸ The impacts of such conflicts are not merely incidental but are often systematic and catastrophic, causing enduring environmental damage that persists long after hostilities have ceased.⁹ This issue has gained prominence as modern warfare increasingly possesses the capacity for large-scale ecological destruction, exacerbating global challenges such as biodiversity loss and climate change.¹⁰ The expanding nature of this phenomenon stems from the absence of effective, binding legal mechanisms for those responsible for environmental degradation. There is a pressing need for robust enforcement mechanisms to be established or improved.¹¹

⁶ ENMOD Convention (adopted 10 December 1976, entered into force 5 October 1978) 1108 UNTS 151, Art. 5. Also accessible via: United Nations Office for Disarmament Affairs (UNODA), ENMOD Convention (UN 1976): <<https://disarmament.unoda.org/enmod/>> accessed 13 April 2025.

⁷ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3, art 35(1). Read further commentary of 1987 of Art. 35 (Basic Rules). Also accessible via: <<https://ihl-databases.icrc.org/en/ihl-treaties/api-1977>> accessed 13 April 2025.

⁸ De Hemptinne J and van Steenberghe R, 'The Protection of The Environment During Warfare: An International Environmental Law Perspective' (2023) 20 Journal of International Criminal Justice 1119.

⁹ Sands P, Peel J, Fabra A and MacKenzie, R. Principles of International Environmental Law (4th ed.), (Cambridge University Press 2018) 828.

¹⁰ Sands P, Peel J, Fabra A, and MacKenzie, R. Principles of International Environmental Law (4th ed.), (Cambridge University Press 2018) 828.

¹¹ Kamran Khan SAKAD, 'The Protection of the Environment in Times of Armed Conflict: International Criminal and Human Rights Law Perspectives' (2024) 3 Pakistan Journal of Law, Analysis and Wisdom 22 – 23.

Existing International legal frameworks in different legal fields – including IHL¹² and IEL¹³ and ICL¹⁴ – have proven inadequate in addressing the complexity and scale of ecological damage caused by armed conflict.¹⁵ The sarin attacks in Syria (2013-2017) remain a focal point for researchers in this domain.¹⁶ Additionally, the ongoing Russia-Ukraine conflict illustrates the devastating consequences of wartime environmental harm.¹⁷ These cases expose significant gaps in both the application and enforcement of existing legal provisions, alongside a lack of accountability mechanisms to address long-term environmental degradation.¹⁸ This thesis undertakes a modest effort to identify the fragmented nature of current legal frameworks as a critical issue that hinders effective mitigation and remediation of environmental harm during armed conflicts. While instruments such as the Environmental Modification Convention (ENMOD), Protocol I of the Geneva Conventions and the Rome Statute provide a legal foundation for addressing wartime environmental damage, the author argues that they remain insufficient in effectiveness, scope and enforceability. Furthermore, these frameworks often fail[ed] to address the cumulative and indirect impacts of conflict on ecosystems, underscoring the urgent need for comprehensive reform.¹⁹ Thus, the central objective of this thesis is to examine the evolution of international law to address inadequacies in existing legal provisions and their implications for environmental and human well-being. Ultimately, it seeks to propose a unified and more enforceable legal framework [i.e., criteria], in which environmental preservation, protection and eventually compensation, are prioritized as a core elements of global conflict resolution and prevention strategies. As emphasized, efforts must be made to develop existing criteria for the more effective enforcement of international environmental, humanitarian, and criminal law concerning environmental degradation during armed conflicts.²⁰

¹²Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3, Art. 35 (Basic Rules) and Art. 55 (Protection of The Natural Environment).

¹³ENMOD Convention (adopted 10 December 1976, entered into force 5 October 1978) 1108 UNTS 151, Art. 1 – 2.

¹⁴Article 8 (war crimes) of the Rome Statute of the International Criminal Court 1988.

¹⁵Bothe M, Bruch CB, Diamond J and Jensen D, 'International law protecting the environment during armed conflict: gaps and opportunities' (2010) 92 International Review of the Red Cross 569 – 570.

¹⁶Shoham D, 'The Syrian Sarin Attacks of August 2013 and April 2017' BESA Center Perspectives Paper No. 452, 1.

¹⁷Pereira P, Symochko L, Inacio M, Bogunovic I and Barcelo D, 'The Russian-Ukrainian armed conflict will push back the sustainable development goals' (2022) 3 Elsevier: Geography and Sustainability 277.

¹⁸Argren R, 'The Obligation to Prevent Environmental Harm in Relation to Armed Conflict' (2023) 105 International Review of the Red Cross 1225.

¹⁹Bothe M, Diamond J and Jensen D, 'International law protecting the environment during armed conflict: gaps and opportunities' (2010) 92 International Review of the Red Cross 569 – 570.

²⁰Sommer M and Quast J, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 284 – 285.

The modern armed conflicts present legal systems with serious difficulties due to modern threats and non-state actors and technological means of warfare. International law does have multiple norms relating to environmental protection, but their applicability, enforceability, and clarity remain limited. This issue will be addressed in subsequent sections.

0.4. The (Sub-)Research Questions

The central question that informs this thesis is as follows: *To what extent can existing international legal frameworks effectively prevent and remedy environmental harm caused by armed conflicts, and how might they evolve to ensure accountability and environmental protection? Regarding the latter – in particular, accountability and environmental issues – what could be an appropriate measure/action in order to address that?*

0.4.1. The Scope of the Thesis

Given the growing recognition of ecocide as a potential international crime in the Rome Statute,²¹ this thesis will not delve into this issue due to main objective of the thesis and its word limitation; only naming it would be sufficient to demonstrate knowledge of its existence.²² By criminalizing severe environmental degradation, it has been argued in the literature that ecocide could fill existing legal gaps and shortcomings,²³ reinforcing the intersection between inter alia international environmental law, humanitarian law, and criminal law in conflict settings.

0.4.2. Sub-Research Questions

- i. What criteria define the effectiveness of International legal frameworks in addressing environmental harm during armed conflict?
- ii. How do specific treaties (e.g. ENMOD Conventions, the Geneva Convention and the Rome Statute) address environmental degradation during armed conflict and what are their limitations?
- iii. How do specific case studies, such as the sarin attacks in Syria and the Russia-Ukraine conflict, highlight the effectiveness and shortcomings of existing international legal frameworks in regulating environmental harm during armed conflict?

²¹Arifin RAM, Wulandari C, Kusuma BH, Wijayanto I, Rasdi and Fikri S, 'Ecocide as the serious crime: A discourse on global environmental protection' (2024) 1355 IOP Conference Series: Earth and Environmental Science.3.

²²See for instance: <<https://www.nytimes.com/interactive/2025/04/02/world/europe/ukraine-russia-war-environment.html>> accessed 4 may 2025. Ukraine is collecting evidence for a claim of ecocide against Russia.

²³Arifin RAM, Wulandari C, Kusuma BH, Wijayanto I, Rasdi and Fikri S, 'Ecocide as the serious crime: A discourse on global environmental protection' (2024) 1355 IOP Conference Series: Earth and Environmental Science. 6.

0.5. Case Studies and Methodology

This thesis employs a variety of research methods to evaluate the effectiveness of international legal frameworks in addressing environmental harm during armed conflicts. The study begins with a normative analysis to develop a framework for assessing legal instruments. The analysis relies on multiple sets of criteria that originate from scholarly sources which include Baakman's work about international law efficiency and information provided by the ICRC and UN.²⁴ Specifically, the ICRC guidelines about environmental protection during armed conflict together with the UN International Law Commission (ILC) Draft Principles about environmental protection,²⁵ form a systematic framework to assess legal effectiveness. These sources contribute to the establishment of fundamental international law components regarding enforceability and accountability alongside clarity. The study's core lies within the extensive examination of legal instruments which consist of the aforementioned instruments. The study uses these instruments as its foundation to assess the effectiveness of legal frameworks. Secondary sources, such as academic literature on IEL, IHL, and ICL, provide additional contexts and insights, in para. 1.7. an extended clarification will be given on the choice for these sources and instruments. The case studies of the chemical attacks in Syria and the Russia-Ukraine war will assess the application and limitations of existing legal frameworks. These cases - the sarin gas attacks in Syria (2013 - 2017) and the Russia-Ukraine conflict (2022 – present) – are aimed to illustrate the shortcomings of current frameworks and underscore the need for stronger accountability and enforceability mechanisms. This thesis will undertake an examination of the relative strengths and weaknesses of IEL, IHL and ICL in addressing environmental harm in these conflicts. This will be achieved by means of an analysis of case studies from each of the three aforementioned fields of international law. Moreover, it will identify areas where integration or reform is necessary, facilitating the formulation of actionable recommendations to enhance the enforceability and effectiveness of these frameworks. As previously mentioned, the methodology integrates primary sources, such as treaties and institutional reports, with secondary sources, including academic analyses and case study research. Thus, this thesis combines a doctrinal legal analysis with the application of a diagnostic framework to two case studies: the conflicts in Syria and Ukraine. The legal analysis focuses on the provisions, scope and institutional mechanisms of the three selected instruments.

²⁴ICRC, *Guidelines in the Protection of the Natural Environment in Armed Conflict* (ICRC2020): <www.icrc.org/en/publication/4382-guidelines-protection-natural-environment-armed-conflict> accessed 2 February 2025.

²⁵International Law Commission (ILC), *Draft Articles on the Protection of Persons in the Event of Disasters, with Commentaries* (UN 2026): <https://legal.un.org/ilc/texts/8_7.shtml> accessed 8 February 2025.

The effectiveness framework used is derived from Baakman's model but modified with insights from managerial compliance theory, ICRC guidelines, and customary international law. These criteria – enforceability and accountability, clarity and precision, and adaptability and evolution – are applied consistently to assess each instrument within the defined case studies.

0.6. Structure

The structure of this thesis is as follows: it is divided into four main chapters, with each one contributing to the overall examination of how international legal frameworks address environmental harm during armed conflict. The first chapter establishes the theoretical foundation by means of the establishment of criteria by which the effectiveness of legal frameworks may be measured. The proposed criteria are drawn from a range of sources, including legal theories, the work of scholars such as Baakman, and ICRC guidelines. The criteria include the following: enforceability and accountability, clarity and precision, and adaptability and evolution. Chapter II applies these criteria to three key international legal instruments: the ENMOD Convention, the Rome Statute, and Additional Protocol I to the Geneva Conventions. The study methodically analyses the scope, strengths and weaknesses of the parties in question, and assesses their current capacity to prevent and remedy environmental damage. Chapter III provides a practical context for the criteria by means of case studies on the Syrian sarin gas attacks and the Russia-Ukraine conflict. The evaluation process involves the assessment of the operational effectiveness of the examined legal frameworks in real-world scenarios, alongside the identification of their limitations. Chapter IV provides a comprehensive response to the central research question and puts forward a series of targeted reforms. The report does not call for new treaties. Instead, it recommends several measures designed to enhance the enforcement mechanisms already in place, to amend the existing frameworks, and to introduce sanctions and funding mechanisms with a view to improving accountability and environmental protection. The chapter concludes with a reflection on broader implications and limitations.

1. Chapter I: Establishing Criteria for Assessment

1.1. Introduction

The present chapter establishes the theoretical foundations for the assessment of the effectiveness of international legal instruments in addressing environmental harm during armed conflicts. The chapter also presents the main international legal instruments relevant to the protection of the environment during armed conflict. The aim is to provide a substantive overview of the applicable and insightful legal frameworks, which will be assessed for their effectiveness on the basis of the criteria set out in Chapter II. Using academic literature, including Baakman's research and ICRC standards, the chapter establishes criteria with a focus on the following: enforceability, clarity, scope, and adaptability. It starts with an exploration of the definition of “effectiveness” in international law, with an emphasis on various scholarly perspectives. These include theories such as the international legal process, which examines how legal mechanisms influence state behavior, and the managerial compliance theory, which emphasizes transparency and norm-building to improve compliance. Additionally, the chapter sheds light on the ICRC's standards and customary international law, examining the current frameworks for environmental protection in armed conflicts. In the interest of brevity, the present study will not undertake an examination of the ICRC standards and rules against the criteria or the international legal framework. It is important to note that even a state is not a signatory to a treaty, it may nevertheless be held accountable for any violations of environmental law resulting in environmental harm during an armed conflict, as established by international customary law. The integration of these diverse perspectives is undertaken with the objective of developing a set of criteria to facilitate a more profound understanding and, potentially, enhancement of the enforcement, accountability, and effectiveness of international environmental law in conflict situations. The (sub-) question to be addressed in this chapter is as follows: *What criteria define the effectiveness of international legal frameworks in addressing environmental harm during armed conflict?*

1.2. Why Effectiveness?

The discussion begins with a requirement to define the term ‘effectiveness’ within international law to establish the core argument of this study. The definition of effectiveness remains flexible because of its interpretative nature, thus requiring a thorough comprehension of what defines effectiveness within this framework. The evaluation of legal instruments to combat environmental harm during wartime requires this crucial definition.

Different legal frameworks show different degrees of flexibility which depends on the chosen approaches to reach particular objectives for problem resolution, compliance and state influence. Baakman's research demonstrates that effectiveness depends on the situation while Young asserts that specific goals require customized adaptation.²⁶ The subsequent section(s) will analyze multiple perspectives to develop a universal framework that assesses the effectiveness of international legal systems which protect the environment during armed conflicts.

1.3. Relevant Theoretical Approaches

In order to develop a comprehensive set of effectiveness criteria, it is important to work further based on the work of scholars and institutions offering diverse insights into international law. The effectiveness of legal frameworks in international law depends on different factors, such as enforcement, clarity, adaptability and legitimacy. This section examines the criteria of Baakman, the ICRC and key legal theories to understand how legal frameworks function in practice. By analyzing different viewpoints, one is able to identify the strengths and limitations of existing laws, particularly those related to environmental harm during armed conflicts. This integrative approach ensures that the criteria developed will be both comprehensive, achievable and practical, addressing actual challenges in strengthening legal protections for the environment during warfare.

1.3.1. The International Legal Process Theory

For decades, there are ongoing debates about the effectiveness of international law in regulating states. One notable approach, developed in the 1970s, is international legal process theory, which seeks to understand how legal decision-makers function within the international legal system.²⁷ In contrast to the New Haven School, which examines the interaction between international law and society as a whole, international legal process theory focuses on specific legal mechanisms and their ability to influence compliance. This approach has been used to develop mid-level theories that explore ways to modify legal processes to achieve their objectives.²⁸ A key challenge in applying legal process theory to international law is the absence of a centralized enforcement mechanism.

²⁶ Baakman (n 3) 44.

²⁷ Steinberg RH and Zasloff JM, 'Power and international law. American Journal of International Law' (2006). 100(1), 78.

²⁸ Steinberg, RH and Zasloff JM, 'Power and international law. American Journal of International Law' (2006). 100(1), 78. And: Chayes A, Ehrlich T, and Lowenfeld AF, International Legal Process (1968); Mary Ellen O'Connell, New International Legal Process, 93 AJIL 334 (1999).

While Hart and Sacks' foundational work influenced the New Haven School and the development of international legal process theory, their framework was primarily designed for domestic legal systems, where a sovereign authority ensures compliance. International law, however, lacks such a body, complicating the issue of effectiveness. Early applications of legal process theory to international law did not adequately address the questions of enforcement and compliance.²⁹

1.3.2. Managerial Theory of Compliance:³⁰

Later scholars, including Abram and Antonia Chayes, have addressed a gap in earlier theories of international law by introducing the managerial theory of compliance. This gap has concerned the lack of focus on how international agreements could be effectively implemented and how states could be incentivized to comply with them, particularly when there was no centralized enforcement mechanism. The managerial theory explains why states comply with international agreements and suggests strategies for enhancing compliance. It emphasizes transparency, norm-building, and the creation of mechanisms that ensure compliance. The theory is based on Louis Henkin's assumption that most states comply with international law most of the time. However, testing the theory's practical application is challenging. The assumption that states generally follow international law does not account for instances where powerful states ignore or undermine legal obligations, particularly in sensitive areas like environmental protection during armed conflicts.

1.4. ICRC-standards / Guidelines on the Environment

The ICRC has developed guidelines to safeguard the environment during armed conflicts. In 2020, the ICRC released the *Guidelines on the Protection of the Natural Environment in Armed Conflict*,³¹ which compile existing IHL rules and provide recommendations to minimize environmental damage during warfare.

²⁹Steinberg RH and Zasloff JM, 'Power and international law. American Journal of International Law' (2006). 100(1), 78. And: The description of the central themes of legal process theory comes from Eskridge and Frickey's outstanding introduction to the Hart and Sacks materials. William N. Eskridge Jr. & Philip P. Frickey, An Historical and Critical Introduction to The Legal Process, in Hart and Sacks, supra note 73, at li, liii.

³⁰Steinberg RH and Zasloff JM, 'Power and international law. American Journal of International Law' (2006). 100(1), 78. And: Abram Chayes and Antonia Handler Chayes, The New Sovereignty: Compliance With International Regulatory Agreements (1998). And: See George W. Downs, David M. Roake and Peter N. Barsoom, Is the Good News About Compliance Good News About Cooperation? 50 INT'L ORG. 379 (1996) (demonstrating that most compliance would have occurred in the Rationalist Institutionalism).

³¹ICRC, *Guidelines on the protection of the Natural Environment in Armed Conflict* (Advance copy, 2020). Also accessible via: <https://www.icrc.org/sites/default/files/document_new/file_list/guidelines_on_the_protection_of_the_natural_environment_in_armed_conflict_advance-copy.pdf> accessed on 13 April 2025.

These guidelines address environmental considerations in military operations and national legal frameworks. By promoting adherence to IHL, the ICRC aims to reduce the ecological impact of conflict and protect communities that rely on natural resources.³²

1.4.1. The Environment, Warfare and the Law: Proportionality Principle³³

IHL provides protection for both civilians and the environment during armed conflicts through general and specific provisions. The general provisions on the conduct of hostilities apply to the environment, as it is generally considered civilian and cannot be intentionally targeted unless it becomes a military objective. Environmental destruction must also be factored into proportionality assessments when striking military targets. Protocol I of the Geneva Conventions explicitly prohibits methods of warfare expected to cause severe environmental damage, as well as attacks on the environment as reprisals. The 1998 Rome Statute classifies such acts as war crimes if they violate the principles of proportionality. Other protections include bans on the destruction of agricultural land and drinking water with the intent to harm civilians. The ICRC has expressed concern about the use of water as a weapon, as its contamination can pose a significant threat to civilian communities. Additionally, the 1976 ENMOD Convention prohibits environmental modification for hostile purposes. The ICRC works to raise awareness among military personnel regarding environmental protection during conflicts, which led to the adoption of the 1994 UN-endorsed Guidelines for Military Manuals, emphasizing the importance of safeguarding the environment during armed conflicts.

1.4.2. Customary International Law

For the sake of brevity, it is sufficient to refer to the following, with a brief examination:

- Rule 43. Application of General Principles on the Conduct of Hostilities to the Natural Environment;³⁴
- Rule 44. Due Regard for the Natural Environment in Military Operations;³⁵

³²ICRC, *Guidelines on the protection of the Natural Environment in Armed Conflict* (Advance copy, 2020), p. 4. Also accessible via: <https://www.icrc.org/sites/default/files/document_new/file_list/guidelines_on_the_protection_of_the_natural_environment_in_armed_conflict_advance-copy.pdf> accessed 9 February 2025.

³³ICRC, *Law and Policy: Environment and Warfare* (ICRC 2020): <www.icrc.org/en/law-and-policy/environment-and-warfare> accessed 9 February 2025.

³⁴ICRC, Customary IHL Database: Rule 43. Application of General Principles on the Conduct of Hostilities to the Natural Environment. Also accessible via: <<https://ihl-databases.icrc.org/en/customary-ihl/v1/rule43>> accessed 15 February 2025.

³⁵ICRC, Customary IHL Database: Rule 44. Application of General Principles on the Conduct of Hostilities to the Natural Environment. Also Accessible via: <<https://ihl-databases.icrc.org/en/customary-ihl/v1/rule44>> accessed 15 February 2025.

- Rule 45. Causing Serious Damage to the Natural Environment.³⁶

Customary International Law plays an important role in protecting the natural environment during armed conflicts, as evidenced by the aforementioned rules. A closer examination of Rules 43, 44, and 45 reveals their embodiment of widely accepted principles that impose legal obligations on parties to a conflict, which can be used to fill gaps in legal instruments, ensuring a better enforcement. These rules underscore the application of general principles of warfare to the environment, the obligation to consider environmental impacts in military operations, and the prohibition of significant environmental degradation. As part of international customary law, these rules are binding on all states, regardless of whether states they have ratified specific treaties, resulting in strengthening the legal framework aimed at minimizing environmental harm in wartime.

1.5. Justification for Assessing Effectiveness

Despite the proliferation of multilateral environmental agreements, significant enforcement challenges remain. As Hedemann-Robinson notes, many states fail to implement their treaty obligations, this could lead to widespread non-compliance and ineffective environmental protection. This issue, known as “treaty congestion”, results in fragmented legal frameworks marked by a lack of coordination and accountability.³⁷ Treaties such as the London Convention, CITES, and the Basel Convention illustrate the shortcomings of international environmental law. States often neglect their reporting obligations, and enforcement mechanisms are inconsistent. In the absence of robust compliance measures, the effectiveness of international environmental law risks becoming largely symbolic.³⁸ Given these challenges, it is essential to assess the effectiveness of legal frameworks – these frameworks selected for the purpose of this thesis.³⁹ As previously noted, this thesis will develop – build further upon the already existing criteria in the literature – a set of criteria to evaluate existing laws and determine whether they effectively prevent and remedy environmental harm in armed conflict. By identifying gaps in enforcement and accountability, the goal is to enhance legal protections and encourage greater compliance with international environmental obligations.

³⁶ICRC, Customary IHL Database: Rule 45. Application of General Principles on the Conduct of Hostilities to the Natural Environment. Also Accessible via: <<https://ihl-databases.icrc.org/en/customary-ihl/v1/rule45>>accessed 15 February 2025.

³⁷Hedemann-Robinson M, , 'Implementation shortcomings and international reaction', Enforcement of International Environmental Law Challenges and Responses at the International Level' (2018) 1st Edition, Routledge 7.

³⁸Hedemann-Robinson M, , 'Implementation shortcomings and international reaction', Enforcement of International Environmental Law Challenges and Responses at the International Level' (2018) 1st Edition, Routledge 8.

³⁹Hedemann-Robinson M, , 'Implementation shortcomings and international reaction', Enforcement of International Environmental Law Challenges and Responses at the International Level' (2018) 1st Edition, Routledge 9.

1.6. Karin Baakman

Baakman's research offers a valuable framework for assessing the effectiveness of international environmental agreements, particularly in the context of biodiversity related treaties.⁴⁰ In her dissertation, she examines five key treaties, analyzing their ability to achieve environmental protection goals. Baakman evaluates their effectiveness based on factors such as the clarity of legal obligations, compliance mechanisms, enforcement, adaptability, and institutional support. Her work underscores the challenges of ensuring that international agreements translate into tangible results, especially in the absence of robust enforcement mechanisms.⁴¹ Baakman's insights are particularly relevant to this study, providing a structured method to assess the effectiveness of legal frameworks in preventing and remedying environmental harm during armed conflicts. Drawing on her criteria, it becomes possible to critically evaluate whether existing legal instruments adequately protect the environment or whether additional measures are needed to enhance accountability and enforcement. The Effectiveness Test, developed by Baakman, is a tool used to evaluate the effectiveness of five key international biodiversity-related treaties. The test consists of ten elements, each with specific benchmarks that assess the effectiveness of a given convention. These elements are outlined as follows:

- Parties: which necessitates participation from the vast majority of states, with a minimum of three-quarters of UN Member States as parties to the convention.⁴²
- Institutional Framework: the presence of a decision-making body that functions effectively, a secretariat and a scientific body, each supported by adequate financial resources to effectively carry out their tasks.⁴³
- Cooperation with environmental non-governmental organizations (NGOs) and other relevant stakeholder groups is to be encouraged.⁴⁴
- The discussion's key is clear objectives, precise measures, and realistic timetables. The convention must establish these, with resolutions and/or decisions from its decision-making body to reinforce them.⁴⁵

⁴⁰Baakman (n 3) 44.

⁴¹Baakman (n 3) 1–2 and 41.

⁴²Baakman (n 3) 61.

⁴³Baakman (n 3) 63.

⁴⁴Baakman (n 3) 70.

⁴⁵Baakman (n 3) 71.

- Implementation: at least three-quarters of the parties must incorporate the convention's core provisions into national laws, regulations, policies and other measures. The secretariat must supervise the process actively and verifiably.⁴⁶
- Reservations, Derogations, and Other Exceptions: It is anticipated that these factors will not impede the attainment of the convention's objectives to a significant extent.⁴⁷
- Monitoring: In order to facilitate the tracking of progress towards the realization of the objectives of the convention, it is essential that reliable scientific data is made available.⁴⁸
- Communication, Education, and Public Awareness (CEPA): It is incumbent upon the decision-making body to implement a comprehensive CEPA program and to ensure public access to up-to-date information.⁴⁹
- Incentives: It is incumbent upon the convention and its decision-making body to provide meaningful incentives, including substantial financial support, for the purpose of facilitating the development of the said countries.⁵⁰
- Compliance and Enforcement: In order to ensure compliance with national laws, regulations, policies and other measures related to the convention's implementation, effective mechanisms must be put in place. Sanctions must be considered where necessary in order to ensure that the desired outcome is achieved.⁵¹

1.7. Adaptation and Integration of Criteria

As mentioned under 0.5, the criteria used in this thesis are informed by Baakman's test, ICRC guidelines and broader theoretical frameworks. The selection and development of effectiveness criteria in this thesis is grounded in that no single legal tradition or academic framework is, in this author's view, fully adequate to address the complex and layered challenge of legal theory, institutional practice, and empirical legal scholarship. Even if some sources are not always cited explicitly in every part, the insights they have offered – conceptually and normatively – have been of significant value in shaping the framework applied here. Baakman's 'Effectiveness Test', originally developed for biodiversity-related conventions, is one of the rich literature which offers a highly structured and operational method for evaluating legal effectiveness.

⁴⁶Baakman (n 3) 74.

⁴⁷Baakman (n 3) 77.

⁴⁸Baakman (n 3) 80.

⁴⁹Baakman (n 3) 82.

⁵⁰Baakman (n 3) 86.

⁵¹Baakman (n 3) 93.

Her focus on enforceability, compliance mechanisms, and definitional clarity forms the analytical foundation upon which is build. However, her work is here adapted to a more specific legal intersection: environmental protection during armed conflicts, where the operative legal terrain included IHL, IEL and ICL. To make this adaptation contextually appropriate, the framework integrates further different elements: firstly, from the managerial compliance theory (discussed in § 1.3.2.), which emphasizes the role of transparency, and institutional support in fostering compliance. Secondly, from ICRC standards and customary IHL (discussed in § 1.4 – 1.4.2.), which provide a normative blueprint for how environmental harm is regulated in armed conflict, and outline customary obligations that may apply even outside treaty-based commitments. These elements, together with the justification for assessing effectiveness (discussed in § 1.5.), allow for a more comprehensive and conflict-sensitive evaluation method. They also reflect the reality that the instruments under study – the ENMOD Convention, The Rome Statute and Additional Protocol I to the Geneva conventions – operate in a fragmented, multi-norm environment where legal effectiveness depends on more than black-letter law alone. Thus, the criteria proposed in this chapter are not abstract constructs. They are developed for a singular, clearly defined purpose: to assess, in a systematic and comparable manner, the practical effectiveness of these three selected legal instruments in mitigating, preventing, and responding to environmental degradation during armed conflict. In that sense, the criteria serve as a diagnostic tool – a lens through which structural strengths and weaknesses can be identified, with a view to formulating grounded, realistic recommendations for improvement. These criteria provide a comprehensive basis for assessing the effectiveness of current and future regulatory frameworks. Finally, in para. 2.1. there is a concise clarification given on the choice of these specific selected instruments.

I. Enforceability and Accountability

o Accountability Mechanisms

The presence of enforcement bodies, especially the International Criminal Court for war crimes,⁵² and United Nations supervisory mechanisms – such as the Human Rights Council for instance – are crucial to ensure adherence to established – inter alia – principles.⁵³

⁵²Article 8 of the Rome Statute.

⁵³Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 International Review of the Red Cross 614 – 616.

However, it is essential that the funding of such entities remains voluntary, unconditional and does not grant undue privileges to any state, thereby preventing institutional instability caused by the withdrawal of financial support.

- **Sanctions and Remedies**

The most effective legal responses to environmental damage must encompass both punitive and reparative measures to ensure accountability. Sanctions may include financial penalties, trade restrictions, or other diplomatic consequences imposed on violators to deter future breaches. Additionally, criminal liability for individuals or entities responsible for severe environmental harm should be pursued where applicable. Remedies, on the other hand, focus on restoring affected ecosystems and communities, which may involve rehabilitation efforts, financial compensation, or mandatory environmental restoration projects.⁵⁴ It is imperative that a balanced approach is adopted, integrating both sanctions and remedies, in order to reinforce compliance, prevent further degradation, and ensure that those responsible contribute to environmental recovery.

- **Non-State Actors and Environmental Degradation**

The increasing involvement of non-state armed groups (NSAG) – such as the Wagner group in the Russia-Ukraine conflict – and private military companies (PMC) in armed conflicts has given rise to significant concerns regarding their accountability for environmental harm.⁵⁵ In contrast to traditional state actors, NSAGs and PMCs often operate in a manner that is not subject to the constraints of international law, resulting in substantial gaps in enforcement and accountability mechanisms. As these groups increasingly engage in conflicts, often in ecologically fragile regions, their actions can lead to severe environmental degradation. Existing legal frameworks remain insufficient in addressing the environmental consequences of their conduct.⁵⁶

⁵⁴For Instance: The reparative measure outlined in Article 75 of the Rome Statute and also Article 8 (2) (b) (iv) of the Rome Statute.

⁵⁵ICRC, Private Military and Security Companies and International Humanitarian Law (ICRC 2020): <<https://www.icrc.org/en/law-and-policy/private-military-and-security-companies#:~:text=The%20majority%20of%20PMSC%20employees,of%201977%20and%20customary%20law>> accessed 23 February 2025.

⁵⁶Schaffer J, 'Prosecution of wartime environmental damage by non-state parties at the International Criminal Court' (2020) 32 Bond Law Review 181.

Therefore, international legal mechanisms must be further developed, designed and reinforced to ensure accountability for all actors – including non-parties of the Rome Statute – contributing to environmental damage during armed conflicts.⁵⁷ Legal provisions explicitly targeting NSAGs and PMCs should be introduced, clearly defining their environmental responsibilities and outlining applicable sanctions. The implementation of such measures would facilitate a more comprehensive approach to environmental protection in conflict zones, ensuring that all parties are held accountable for both intentional and unintentional environmental harm. Thus, this criterion could fall under accountability and finally also under “clarity and precision”, in such a way that non-state actors should be held accountable for the above mentioned acts and that such actors should be taken into account in the drafting or amending of legislations.

II. Clarity and Precision

○ Legal Definitions

It is imperative that provisions are formulated with precision, thus avoiding the use of vague terminology such as that found in Protocol I and the Rome Statute (e.g., widespread, long-term, and severe). Such terminology has been the subject of criticism on account of its capacity to hinder effective enforcement. The establishment of clear and universally accepted definitions is of significant importance in ensuring consistency in interpretation and application.⁵⁸

○ Clear Obligations

The establishment of explicit obligations within international legal frameworks is of crucial importance. Such obligations must be articulated in precise and unambiguous language in order to effectively define and prohibit environmental degradation during armed conflict. Legal provisions should be formulated in such a way as to leave no room for interpretative uncertainty, thereby strengthening enforcement and ensuring accountability.⁵⁹

⁵⁷Schaffer J, ‘Prosecution of wartime environmental damage by non-state parties at the International Criminal Court’ (2020) 32 *Bond Law Review* 194.

⁵⁸ Pismisi K, ‘Criminalizing Environmental Degradation and Devastation: New Prospects for the ICC Rome Statute?’ (2023) 38 (2), *American University International Law Review* 455.

⁵⁹Heller JCL, ‘The First Ecocentric Environmental War Crime: The Limits of Article 8 (2)(b)(iv) of the Rome Statute’ (2007) 20 *Georgetown International Environmental Law Review* 62.

III. Adaptability and Evolution:⁶⁰

○ Flexibility in Addressing Emerging Threats

It is imperative that the criteria allow for adaptation to the challenges posed by modern warfare, including, but not limited to, cyber warfare targeting environmental infrastructure.⁶¹ A water purification plant is a prime example of environmental infrastructure. Such facilities play a significant role in ensuring access of clean drinking water to populations, and as such, can be subject to significant disruption in the event of cyber-attacks targeting their control systems.⁶² As previously stated, the aforementioned disruptions, which have been caused by cyberattacks on control systems, have the potential to have severe humanitarian and environmental consequences. Therefore, it is imperative to include modern warfare methods, such as cyberattacks, in the drafting and or amending of legislations.

○ Post-Conflict Environmental Restoration

In the aftermath of armed conflict, the legal requirement for those identified as responsible parties to provide funding for ecological recovery initiatives should be established.⁶³ Failure to comply with this obligation may result in the imposition of political or economic sanctions, including trade restrictions, financial penalties, bank account freeze or visa restrictions, with the aim of ensuring accountability and enforcing compliance with International Law.⁶⁴ The integration of environmental remediation with legal obligations is pivotal in ensuring the long-term restoration of ecosystems and serving as a preventative measure against violations.⁶⁵

1.7.1. Selected Criteria

The following criteria shall be taken into consideration during the assessment of the aforementioned legal frameworks – in chapter II and III.

- **Enforceability and Accountability:** assess the extent to which the legal instrument enables monitoring, sanctions or judicial action in case of violations;

⁶⁰Verwey WD, 'Protection of the Environment in Times of Armed Conflict: In Search of a New Legal Perspective' (1995) 1 LJIL 7.

⁶¹Arkin WM, 'Cyber Warfare and The Environment' (2001) 25 Vermont Law Review 788 – 791.

⁶²Arkin WM, 'Cyber Warfare and The Environment' (2001) 25 Vermont Law Review 781.

⁶³Among others: Filho WL and others, 'The environment as the first victim: The impacts of the war on the preservation areas in Ukraine' (2024) 364 Journal of Environmental Management 2.

⁶⁴This goes all the way with the point mentioned under "Enforceability and Accountability: Sanctions and Remedies."

⁶⁵Filho WL and others, 'The environment as the first victim: The impacts of the war on the preservation areas in Ukraine' (2024) 364 Journal of Environmental Management 2.

- Clarity and Precision: evaluates whether the provisions are specific enough to be operationalized by active actors;
- Adaptability and Evolution: considers the framework's adaptability to respond to changing forms of warfare and emerging environmental threats.

The reason for this selection is the existence of both similarities and differences between the three legal frameworks. In order to formulate a comprehensive conclusion and a logical text that progresses coherently throughout the entire thesis, it is necessary to take these differences and similarities into consideration.

1.8. Conclusion

In response to the sub-research question, this chapter has developed a multidimensional set of criteria to define the effectiveness of the ENMOD, the Rome Statute and Protocol I in addressing environmental damage during armed conflict. Drawing on the work of Baakman, the ICRC and relevant legal theory, effectiveness is understood not as a singular or static concept, but as a complex interplay of enforceability, clarity, scope and adaptability. The criterium of enforceability and accountability reflects the essential need for robust compliance mechanisms, including independent enforcement bodies, sanctions and reparations. Special attention must be paid to non-state actors, such as PMCs and NSAGs, whose growing role in modern conflicts represents a gap in current enforcement systems. Clarity and precision are essential to ensure legal certainty. This includes unambiguous definitions and obligations that can be interpreted and applied consistently across jurisdictions. Vague terms such as “widespread”, “long-term” and “severe”, as found in existing treaties, undermine the practical enforceability of environmental protection and need to be revised. Adaptability and evolution are critical in an era of rapid technological and geopolitical change. Legal frameworks must be able to respond to emerging threats, such as cyber warfare targeting environmental infrastructure, while also providing for post-conflict environmental restoration. Taken together, these criteria provide a comprehensive basis for assessing the effectiveness of existing and future regulatory frameworks. They provide not only a diagnostic tool for assessing current shortcomings, but also a normative guide for reform. Ultimately, a truly effective legal regime is one that not only prevents and remedies environmental damage during armed conflict, but also evolves in response to new threats and ensures accountability of all actors.

2. Chapter II: Applying The Effectiveness Criteria on Specific Treaties

2.1. Introduction

This chapter outlines the legal foundations relevant to environmental damage armed conflicts, examining both substantive provisions and enforcement frameworks. It builds on the effectiveness criteria developed in the previous chapter – enforceability and accountability; clarity and precision; and adaptability and evolution – in order to assess the effectiveness of these instruments in protecting the environment during conflict. Rather than separating international environmental law, international humanitarian law and international criminal law, this chapter treats them together to assess their combined ability to prevent and respond to environmental damage. The analysis focuses on the main treaties within this legal framework, including the 1976 ENMOD Convention, the 1998 Rome Statute and Additional Protocol I to the Geneva Conventions. Each treaty is examined in terms of its enforceability, clarity and adaptability, identifying both strengths and weaknesses. These instruments were selected because they provide representative coverage of the three fields of law – IHL, ICL, and IEL – that this thesis aims to assess in light of its main research question. Moreover, the instruments directly touch upon the core research areas – based on the criteria to be assessed against these instruments – thus identifying gaps where improvement is necessary. While the author acknowledges the relevance of other legal regimes – such as IHRL – the focus here is limited to instruments that specifically governs actions and conduct during armed conflict. This targeted selection ensures analytical consistency and allows for critical evaluation thereof. The (sub)research question to be addressed in this chapter is as follows: *How do specific treaties (e.g. ENMOD Conventions, the Geneva Convention and the Rome Statute) address environmental degradation during armed conflict and what are their limitations?*

2.2. The 1976 ENMOD Convention in a nutshell:⁶⁶

The 1976 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) was adopted in order to prevent the environment from being exploited as a weapon of warfare. The convention prohibits the deliberate manipulation of natural processes with the intention of causing widespread, long-term, or severe environmental destruction, including, but not limited to, altering weather patterns or inducing seismic activity.

⁶⁶Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (adopted 10 December 1976, entered into force 5 October 1978) 1108 UNTS 151.

Adopted by the UN General Assembly in 1976 and entering into force in 1978, the Convention obliges state parties to refrain from engaging in, assisting, or encouraging environmental modification for hostile purposes. The ENMOD's protective framework is reinforced by the Additional Protocol I of the Geneva Conventions (1977) and the Rome Statute (1998), both of which restrict warfare methods that result in excessive environmental damage. These instruments will be further examined in subsequent sections. For the purpose of this thesis, two key provisions of the ENMOD Convention are of significant importance, namely:

- Article I states that:⁶⁷

“Each State Party to this Convention undertakes not to engage in 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.”

- Article II defines the following:⁶⁸

“As used in Article I, the term “environmental modification techniques” refers to any technique for changing – through the deliberate manipulation of natural processes – the dynamics, composition or structure of the earth ... etc.”

2.2.1. Limitation(s) of the ENMOD Convention

The effectiveness of the ENMOD Convention in ensuring comprehensive environmental protection during armed conflicts is limited by several constraints when assessed against the criteria of enforceability and accountability, clarity and precision, and adaptability and evolution developed in Chapter I. First and foremost, the convention applies only to the military or hostile use of environmental modification techniques. This narrow scope, laid down in Articles I and II, excludes environmental damage resulting from non-international armed conflicts (NIACs).⁶⁹ Moreover, the convention binds only state parties – it clearly states: *each state party*, meaning that not all actors involved in conflict – particularly non-state actors – can be held accountable under these provisions. At least, not in the current legal form of the convention. In addition, the definition of environmental modification techniques is narrow, prohibiting only the deliberate manipulation of natural processes.⁷⁰

⁶⁷*Idem.*

⁶⁸*Ibid.*

⁶⁹Dinstein, Y, ‘Protection of the environment. In The Conduct of Hostilities under the Law of International Armed Conflict’ (2016), Cambridge University Press 232.

⁷⁰Dinstein, Y, ‘Protection of the environment. In The Conduct of Hostilities under the Law of International Armed Conflict’ (2016), Cambridge University Press 233.

As a result, collateral environmental damage resulting from attacks on military targets falls outside its scope, further weakening the ability of the ENMOD convention to provide effective remedial or punitive measures for environmental damage. Another challenge relates to the Convention's damage threshold, which is set at “widespread, long-lasting, or severe” impacts.⁷¹ This high and cumulative threshold reflects a lack of clarity and precision, as it leaves significant room for interpretation,⁷² and may allow substantial environmental damage to go/remain unaddressed.⁷³ The lack of clear definitions for key terms such as “widespread” and “long-lasting” makes consistent interpretation and application difficult and directly undermines the clarity criterion. Furthermore, the lack of customary law status of the ENMOD convention means that its provisions are not universally binding on states that have not ratified it,⁷⁴ raising concerns about enforceability and accountability. In addition, the lack of provisions in this convention to address non-hostile environmental damage creates a legal gap in protection, further limiting the scope for effective enforcement and remedies. Another criticism is that the convention focuses on future techniques rather than the immediate environmental damage caused by conventional warfare.⁷⁵ This forward-looking focus reveals limitations in clarity, adaptability, and evolution – particularly regarding emerging threats such as cyber warfare targeting environmental infrastructure. One of the core issues with the ENMOD Convention is that it does not directly clarify whether digital or cyber means fall within its scope, meaning that these sort of methods are probably not protected within the current scope of the ENMOD-convention. As a result, the legal status of environmental harm caused by cyber-technologies remains ambiguous. This uncertainty undermines the Convention’s capacity to address contemporary forms of environmental disruption. In conclusion, while the ENMOD convention provides a basic legal framework for the prevention of hostile environmental modifications, its limitations, when assessed through the lens of enforceability and accountability, clarity and precision, and adaptability and evolution, render it inadequate to comprehensively address all forms of environmental harm resulting from military activities.⁷⁶

⁷¹Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 *International Review of the Red Cross* 626.

⁷²Dinstein, Y, 'Protection of the environment. In *The Conduct of Hostilities under the Law of International Armed Conflict*' (2016), Cambridge University Press 249.

⁷³Dinstein, Y, 'Protection of the environment. In *The Conduct of Hostilities under the Law of International Armed Conflict*' (2016), Cambridge University Press 233.

⁷⁴Dinstein, Y, 'Protection of the environment. In *The Conduct of Hostilities under the Law of International Armed Conflict*' (2016), Cambridge University Press 232.

⁷⁵Dinstein, Y, 'Protection of the environment. In *The Conduct of Hostilities under the Law of International Armed Conflict*' (2016), Cambridge University Press 249.

⁷⁶Dinstein, Y, 'Protection of the environment. In *The Conduct of Hostilities under the Law of International Armed Conflict*' (2016), Cambridge University Press 250.

2.3. Rome Statute in a Nutshell:⁷⁷

Prior to the Vietnam War, the issue of environmental damage caused by warfare was largely seen as a domestic concern, with international law only addressing such destruction when it directly affected human interests. However, in the aftermath of the Vietnam War, the international community recognized a significant gap in the legal framework and responded by adopting several conventions aimed at prohibiting environmental damage during armed conflicts.⁷⁸ In addition to the ENMOD Convention already discussed, one such agreement was the Rome Statute, which entered into force in 2002. Unlike previous treaties, the Rome Statute established the International Criminal Court (ICC) under international law.⁷⁹ Moreover, the ICC is the first permanent and universal court for prosecuting serious international crimes. Based in The Hague, it has nearly 100 member states and operates with eighteen elected judges. The court has three divisions: Appeals, Trial, and Pre-Trial. The Prosecutor leads the Office of the Prosecutor. The ICC prosecutes key crimes when national courts are unwilling or unable to act, but not terrorism or drug trafficking and only when these crimes are not covered by other courts. The court's jurisdiction is limited by the absence of key states like China, the United States and Russia, and its role is governed by complementarity.⁸⁰ For the purposes of this thesis, the following provision is of particular importance:

- Article 8 (2) (b) (iv) states that:

“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 natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated.”

2.3.1. Limitation(s) of the Rome Statute

The criminalization of environmental destruction in armed conflict under the Rome Statute encounters has several limitations when assessed against the criteria of enforceability and accountability, clarity and precision, and adaptability and evolution developed in Chapter I. The most significant limitation relates to the vagueness of key terms such as “widespread,” “long-term,” and “severe,” which are not adequately defined.

⁷⁷Rome Statute of the International Criminal Court (adopted 17 July 1998, entered into force 1 July 2002) 2187 UNTS 90.

⁷⁸Heller JCL, ‘The First Ecocentric Environmental War Crime: The Limits of Article 8 (2)(b)(iv) of the Rome Statute’ (2007) 20 Georgetown International Environmental Law Review 61.

⁷⁹Article 1 of the Rome Statute.

⁸⁰Aust A, ‘International Criminal Law’ in *Handbook of International Law* (Cambridge University Press 2005) 277.

This lack of clarity and precision complicates consistent interpretation and hinders effective enforcement, making prosecution of environmental war crimes particularly difficult.⁸¹ Furthermore, the limited applicability of Article 8 (2)(b)(iv), which is limited to international armed conflicts and exclude non-international armed conflicts (NIACs),⁸² negatively affects enforceability and accountability by leaving a significant category of environmental damage unaddressed within the current scope of the statute. Another challenge is proportionality requirement.⁸³ This requires proof that the environmental damage caused was "clearly excessive" in relation to the expected military advantage, which creates a significant burden of proof. The inclusion of a proportionality requirement in the ICC Statute allows for a defense based on military necessity. This could lead to the justifications of environmental damage if it is deemed to provide a military advantage, potentially undermining environmental protection.⁸⁴ This standard, combined with the possibility of invoking military necessity as a defense, undermines the enforceability of sanctions and remedies by creating significant barriers to successful prosecutions. Moreover, the requirement of subjective mens rea, meaning that the perpetrator must know that this actions will cause disproportionate environmental damage, creates an additional legal barrier,⁸⁵ that weakens enforceability and reduces the likelihood of holding individuals accountable. It is clear that the ICC Statute's provision on environmental damage requires the accused to prove that he or she knew that his or her actions would cause the specified environmental damage. This high standard of proof may make prosecutions difficult, as it may be difficult to prove that military personnel were aware of the potential environmental consequences.⁸⁶ Besides that, the lack of direct criminalization of environmental damage is a significant issue: although references in the ICC Statute and in Protocol I to the Geneva Conventions have established criminal liability for environmental damage in wartime, the stringent requirements for proving such liability may render these provisions ineffective in practice, highlighting a gap in enforceability and accountability.

⁸¹Heller JCL, 'The First Ecocentric Environmental War Crime: The Limits of Article 8 (2)(b)(iv) of the Rome Statute' (2007) 20 Georgetown International Environmental Law Review 62.

⁸²Heller JCL, 'The First Ecocentric Environmental War Crime: The Limits of Article 8 (2)(b)(iv) of the Rome Statute' (2007) 20 Georgetown International Environmental Law Review 84.

⁸³Heller JCL, 'The First Ecocentric Environmental War Crime: The Limits of Article 8 (2)(b)(iv) of the Rome Statute' (2007) 20 Georgetown International Environmental Law Review 89.

⁸⁴Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 International Review of the Red Cross 596 – 597 and 632.

⁸⁵Heller JCL, 'The First Ecocentric Environmental War Crime: The Limits of Article 8 (2)(b)(iv) of the Rome Statute' (2007) 20 Georgetown International Environmental Law Review 90.

⁸⁶Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 International Review of the Red Cross 620.

The high thresholds and complex conditions mean that actual prosecutions for environmental damage are likely to be rare, relying as they do on proof of intent rather than the application of an objective standard. A final clarification regarding the protection of civilian infrastructure and that of the natural environment, it's important to distinguish between these two. Attacks on civilian infrastructure – such as water treatment facilities – could result in environmental harm. However, the protection of such civilian objects does not fall under the scope of Article 8(2)(b)(iv). Thus, these facilities are protected because of their status as civilian objects, not their environmental importance. This is laid down in Article 8(2)(b)(ii) of the Rome Statute. In conclusion, the limitations of the Rome Statute in terms of enforceability and accountability, clarity and precision, and adaptability and evolution, when assessed against the developed criteria, significantly undermine the effectiveness of international criminal law in addressing wartime environmental destruction.

2.4. The 1987 Additional Protocol I of The Geneva Conventions in a Nutshell

In addition to the ENMOD Convention and the Rome Statute, the international community has developed other legal measures to mitigate the profound and lasting environmental damage caused by war. A key development is the Additional Protocol I to the Geneva Conventions - adopted in 1977 and reaffirmed in 1987 - which strengthens the protection of the environment during armed conflict by explicitly prohibiting military actions harmful to the natural environment.⁸⁷ This development reflects the recognition that environmental damage directly affects the well-being and survival of civilians.⁸⁸ The Geneva Conventions themselves, first adopted in 1949, are a cornerstone of international humanitarian law.⁸⁹ They aim to protect those who are not taking part in hostilities, such as civilians, medical personnel and aid workers, as well as those who are no longer taking part, such as wounded soldiers and prisoners of war. The Conventions set out rules to limit the impact of armed conflict on people and, indirectly, on civilian infrastructure. Additional Protocol I supplements the Geneva Conventions by modernizing and extending the protection of civilians, particularly in international armed conflicts. It requires the parties to distinguish at all times between civilians and combatants and between civilian and military objectives, and to direct operations only against legitimate military targets, Article 48.

⁸⁷Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3.

⁸⁸Sommer M and Quast J, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 292.

⁸⁹Geneva Conventions of 12 August 1949, 75 UNTS 31.

It reinforces the principle of proportionality, ensuring that incidental harm to civilians is not excessive in relation to the military advantage expected to be gained. Article 35 prohibits the use of means or methods of warfare that cause unnecessary injury or suffering, while provisions on reprisals strengthen the protection of civilians and civilian objects. Today, with 162 parties, Additional Protocol I is a widely ratified instrument that modernizes the rules of warfare and significantly enhances the protection of civilians. Its integration of environmental considerations into the conduct of hostilities demonstrates a broader commitment to minimizing the human and environmental costs of armed conflict, ensuring that warfare does not endanger human survival or the well-being of future generations.⁹⁰ For the purpose of this thesis, two provisions are of significant importance, namely:

- Basic rules: Article 35 (3) states the following:⁹¹

“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.”

- Protection of the natural environment: Article 55 (1) states the following:⁹²

“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.”

2.4.1. Limitation(s) of Protocol I of the Geneva Conventions

The limitations of Protocol I to the Geneva Conventions, which focuses on the protection of the victims of international armed conflict, are particularly evident in its failure to comprehensively regulate wartime environmental damage when assessed against the criteria developed in Chapter I: enforceability and accountability, clarity and precision, and adaptability and evolution. A key limitation lies in the enforceability and accountability of Protocol I.

⁹⁰Aust A., 'International Criminal Law' in *Handbook of International Law* (Cambridge University Press 2005) 251 – 260.

⁹¹Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3, art 35(1). Read further commentary of 1987 of Article 35 (Basic Rules). Also Accessible via:<<https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-35?activeTab=>> accessed 16 February 2025. See also commentary on Article 35:<<https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-35/commentary/1987?activeTab=>> accessed 16 February 2025.

⁹²Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3, art 35(1). Read further commentary of 1987 of Article 55 (Protection of the natural environment). Also accessible via:<<https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-55?activeTab=>> accessed 16 February 2025.:See also commentary on Article 55:<<https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-55/commentary/1987?activeTab=>> accessed 16 February 2025.

While Article 35(3) prohibits methods of warfare that cause “widespread, long-term and severe” environmental damage, and Article 55(1) requires the protection of the environment against such damage, the sanctions and remedies available for violations are limited. The high threshold for damage, which requires all three conditions – widespread, long-term and severe – to be met, reduces the likelihood of successful enforcement. Many cases of environmental damage that could be significant are excluded from regulation because of this stringent standard, and the sanctions for breaches are not clearly outlined, leading to inadequate deterrence and accountability. Remedies such as rehabilitation or compensation are similarly vague and not guaranteed under the Protocol, further weakening accountability for violations. In addition, a major limitation of the Additional Protocol I is its limited scope. Primarily applicable to international armed conflicts, it excludes non-international armed conflicts. As a result, cases of environmental damage in civil wars or internal conflicts remain unaddressed under this framework.⁹³ The clarity and precision of the legal definitions in Protocol I are also a challenge. The terms “widespread”; “long-term” and “severe” are not clearly defined, leading to inconsistent interpretation and application. This lack of clear definitions leads to legal uncertainty about the scope of environmental protection during armed conflict. As highlighted in Chapter I, the establishment of clear legal definitions is essential to ensure consistency in enforcement and to avoid ambiguities that can hinder accountability.⁹⁴ As mentioned before, this ambiguity reduces the effectiveness of the provisions and creates legal uncertainty as to the extent of environmental protection under Protocol I. As previously mentioned, all three conditions must be met cumulatively, which may result in many incidents of environmental damage not being considered or even recognized as significant from an environmental perspective.⁹⁵ In addition, the author argues that the adaptability and evolution of Protocol I in addressing emerging threats – such as cyber warfare targeting environmental infrastructure – is another critical issue. While Protocol I, especially Article 35 and 55, addresses traditional forms of warfare, these provisions do not explicitly encompass modern threats, or any means of cyber warfare that can cause environmental damage.

⁹³Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 *International Review of the Red Cross* 612.

⁹⁴Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 *International Review of the Red Cross* 623.

⁹⁵Wyatt J, 'Law-making at the intersection of international environmental, humanitarian and criminal law: the issue of damage to the environment in international armed conflict' (2010) 92 *International Review of the Red Cross* 626.

It is noteworthy to make the following nuance to get this matter clear(er): although some states, as well as NATO, have considered the applicability of Protocol I.⁹⁶ Also the UN Group of Governmental Experts has considered the same matter – implying broad recognition thereof.⁹⁷ The nuance the author aims to make is the following: it is not a matter of whether cyber warfare acknowledged to fall under the general scope of IHL, including Protocol I. Rather, the point is whether the provisions specifically regulating the protection of the ‘natural environment’ – as stated in Articles 35 and 55 of Protocol I – are proper and up to date – i.e., whether the legal framework is sufficiently flexible and clear to address the contemporary and evolving methods of warfare, including means of cyber warfare, while denying any form of informal or incorrect interpretation and thus ensuring legal certainty. In conclusion, when assessed against the criteria of enforceability and accountability, clarity and precision, and adaptability and evolution, the provisions of Protocol I fall short of providing comprehensive and explicit protection for the environment in armed conflict. Its high threshold for environmental damage, ambiguous definitions, limited applicability and failure to address modern threats significantly undermine its ability to effectively protect the environment.

2.5. Differences and Similarities

The objectives of the ENMOD Convention, the Rome Statute, and Additional Protocol I to the Geneva Conventions are, in part, to mitigate environmental harm during armed conflict. Despite the commonality of their objectives, each instrument differs in terms of scope, enforceability, clarity, and adaptability. This section provides a detailed analysis of the similarities and differences between the aforementioned legal instruments, with a view to highlighting overlaps, gaps, and potential areas for strengthening the legal framework.

2.5.1. Similarities

Although the three instruments have been developed in different contexts and legal domains (environmental law, criminal law and humanitarian law), they nevertheless share notable similarities. Firstly, all three prohibit or restrict environmental damage during armed conflict, especially when such damage is widespread, long-term, and severe. The ENMOD Convention and Additional Protocol I both explicitly utilize this tripartite threshold, indicating what may be termed a convergence in the understanding of environmentally harmful conduct.

⁹⁶ Van den Essen, R, ‘Targeting data in Armed conflict: Interpreting International Humanitarian Law’s fundamental notions of ‘attack’, ‘object(ive)’ & ‘damage’ against the effects of cyber operations’ (Universiteit van Amsterdam 2024), p. 17.

⁹⁷ *Idem*.

Secondly, each instrument demonstrates an intent to protect the environment, either directly or indirectly. The Rome Statute, whilst principally concerned with human rights violations, incorporates environmental damage within its definition of war crimes as set out in Article 8(2)(b)(iv). In a similar manner, Additional Protocol I establishes a correlation between environmental degradation and the survival and well-being of civilian populations, thereby adopting a human-centered approach to environmental protection. Finally, all three frameworks encounter common challenges in the enforcement stage. The thesis argues that there are no clear, direct or effective mechanisms in place to hold violators, particularly powerful states or non-state actors, accountable. With regard to the latter, and with respect to modern means of warfare, particularly cyber warfare, the silence of the three instruments on this matter does not imply implicit protection.

2.5.2. Differences

Despite these commonalities, significant differences exist between the instruments. The objective of the ENMOD Convention is to prevent the use of deliberate environmental modification techniques as weapons. The discussed provisions fail to address the issue of non-international armed conflicts, and do not include provisions for the management of collateral environmental damage. These limitations result in a restricted practical reach. In contrast, the Rome Statute establishes individual criminal accountability through the ICC, thereby offering a more direct enforcement mechanism. Nevertheless, it establishes a stringent standard for prosecution, necessitating evidence of intent and a comprehensive evaluation of military advantage versus environmental impact, thereby significantly constraining its practical application. It is important to note that the Additional Protocol I is principally concerned with the governance of conduct during international armed conflict, encompassing a broader range of humanitarian concerns. The principle of environmental protection is integrated within the proportionality and distinction principles of international humanitarian law. In contrast to the ENMOD Convention, it does not concentrate on particular techniques but rather on the outcomes of military operations. Of the three instruments, Additional Protocol I is the most integrated into international humanitarian law, particularly through its application of proportionality and distinction.

It addresses environmental harm during hostilities, and contemporary challenges such as cyber warfare means. However, its humanitarian focus does not explicitly and clearly extend to the technological dimensions of modern conflict, despite the broad recognition of international actors,⁹⁸ as explained in para. 2.4.1. The Rome Statute similarly lacks clear provisions on emerging threats. Its formulation of environmental war crimes is limited by stringent thresholds and reliance on conventional military necessity. As a result, its adaptability to unconventional or evolving forms of warfare remains constrained. The ENMOD Convention was initially forward-looking in its ambition to prohibit hostile environmental modification techniques, but its focus is narrow and increasingly outdated. The following serves to summarize the key points of the preceding discussion: despite the significance of the ENMOD Convention, the Rome Statute, and Additional Protocol I in their endeavors to integrate environmental concerns into the legal framework of armed conflict, each of these instruments is characterized by inherent structural limitations. It is evident that the current legislation is characterized by the utilization of ambiguous legal language, a circumscribed scope, inadequate enforcement provisions, and an incapacity to address contemporary threats.

2.6. Conclusion

In response to the sub-research question, this chapter examined the regulation of environmental degradation during conflict and the limitations of the ENMOD Convention, Additional Protocol I to the Geneva Conventions and the Rome Statute. These treaties highlight the international community's recognition of the need to protect the environment in war, but a fragmented approach hinders practical effectiveness. The ENMOD Convention bans the deliberate disruption of natural processes as a method of warfare. Although it reflects an early concern for environmental protection, the discussed provisions are now mostly symbolic due to their limited scope. It only deals with harmful modifications of the environment caused by warfare and does not cover damage arising from other kinds of conflict. Additional Protocol I included environmental provisions in Article 35(3) and 55 (1) to mark a significant development. These provisions prohibit warfare causing severe damage to the environment, creating a new norm, but enforcement is difficult due the threshold and lack of definitions. Obligations are state-centric, leaving uncertainty on application to non-state actors and non-international conflicts. The Rome Statute introduces individual criminal responsibility for environmental harm under Article 8(2)(b)(iv). This development is symbolic, however, the provision has never been applied in practice and suffers from similar issues and challenges.

⁹⁸ Van den Essen (n 96) 17.

The requirement that the environmental damage be clearly excessive in relation to any anticipated military advantage has also proven difficult to interpret and enforce, and the ICC's jurisdictional limitations restrict the provision's practical reach. A close examination of these legal instruments reveals significant gaps in the protection of the environment during armed conflict. The frameworks demonstrate a lack of coherence and consistency, are constrained by high evidentiary thresholds, and suffer from vague terminology and weak enforcement mechanisms. This legal fragmentation has been demonstrated to undermine accountability and reduce the potential deterrent effect of existing norms. It is evident that the present treaty framework is inadequate in addressing the environmental challenges posed by contemporary armed conflicts. Chapter IV will reflect on the broader implications of these findings and consider potential reforms aimed at strengthening the international legal framework governing environmental protection in warfare.

3. Chapter III The Criteria in a Practical Context

3.1. Introduction

The present chapter conducts an examination of the practical application of international legal frameworks in the context of armed conflict. This is to be achieved by means of an analysis of two contemporary case studies: the sarin gas attacks in Syria and the ongoing Russia-Ukraine war. This examination is necessary to demonstrate how legal frameworks have failed to prevent or address specific instances of environmental damage. By focusing on two case studies – the sarin gas attacks in Syria and the Russia-Ukraine conflict – this chapter aims to ground the thesis' legal analysis in observable realities. The analysis will reveal how legal ineffectiveness manifests not only as institutional weakness, but as a direct contributor to unremedied environmental destruction. The (sub-) research question to be addressed is as follows: *How do specific case studies, such as the sarin attacks in Syria and the Russia-Ukraine conflict, highlight the effectiveness and shortcomings of existing international legal frameworks in regulating environmental harm during armed conflict?*

3.2. Testing Legal Effectiveness: Ukraine and Syria

As mentioned earlier, it is thought that empirical evidence may be useful in evaluating the effectiveness and limitations of existing legal frameworks. It is proposed that case studies may be conducted, focusing on the sarin gas attacks in Syria (2013-2017) and the ongoing Russia-Ukraine conflict (2022-present). Furthermore, it is hoped that these incidents, will help to reveal significant gaps in current legal systems, as well as the consequences of armed conflicts on the environment and human beings,⁹⁹ underscoring the urgent need for more robust accountability and enforcement mechanisms. It may also be useful to provide practical examples of contemporary challenges the global community is facing, as these examples highlight the shortcomings of existing frameworks and emphasize the necessity for reforms.

3.3. Applying the Effectiveness Test: An Examination

The discussed criteria in this thesis will be examined on the three discussed international legal frameworks that covers the legal fields of ICL, IEL and IHL. The selected criteria to be applied in this case are the same as those mentioned under 2.2, namely:

⁹⁹This will be assessed based on literature and case-studies. Examples of such literature are: 1) Dany Shoham, The Syrian Sarin Attacks of August 2013 and April 2017, BESA Center Perspectives Paper No. 452 (26 April 2017), and; 2) Pereira P, Symochko L, Inacio M, Bogunovic I and Barcelo D, 'The Russian-Ukrainian armed conflict will push back the sustainable development goals' (2022) 3 Elsevier: Geography and Sustainability 277.

- Enforceability and accountability (sanctions and remedies);
- Clarity and precision (legal definitions);
- Adaptability and evolution (flexibility to address emerging threats).

3.4. The Ongoing Ukraine-Russia war 2022-present

This case study demonstrates how conflict-induced environmental damage disrupts global sustainability. Pereira et al. examine how war amplifies food system vulnerabilities and accelerates environmental degradation, ultimately hindering the achievement of global sustainable development goals (SDGs).¹⁰⁰ Widespread destruction of land, infrastructure and facilities has resulted in serious environmental concerns, including soil and water contamination. These events could affect the ecosystems, public health, and livelihoods.¹⁰¹ Furthermore, these challenges are likely to exacerbate the already difficult process of long-term recovery for affected communities.¹⁰² Thus, two dimensions of the Russia - Ukraine conflict in particular stand out: the greenhouse gas emissions caused by ongoing military operations and the strategic weaponization of natural resources such as water.

Green House Gas Emissions

In the existing literature, there is a consensus that the Intergovernmental Panel on Climate Change's (IPCC) reporting guidelines for greenhouse gas emissions are inadequate in accounting for emissions from military activities, constituting a significant oversight. According to assessments, approximately 77 million metric tons of CO₂-equivalent emissions were generated within a mere 18 months of military operations related to the Ukraine conflict.¹⁰³ This case study emphasizes the pivotal necessity to incorporate emissions from military operations into national greenhouse gas (GHG) reporting frameworks. The prevailing guidelines frequently result in underreporting, which is anticipated to be considerable.¹⁰⁴

¹⁰⁰Pereira P, Symochko L, Inacio M, Bogunovic I and Barcelo D, 'The Russian-Ukrainian armed conflict will push back the sustainable development goals' (2022) 3 Elsevier: Geography and Sustainability 277.

¹⁰¹Adamski KYESGRA, 'Russia-Ukraine war impacts on environment: warfare chemical pollution and recovery prospects' (2025) Environmental Science and Pollution Research 1.

¹⁰²Adamski KYESGRA, 'Russia-Ukraine war impacts on environment: warfare chemical pollution and recovery prospects' (2025) Environmental Science and Pollution Research 14.

¹⁰³Rostyslav Bun and others, 'Tracking unaccounted greenhouse gas emissions due to the war in Ukraine' (2024) 914 Science of the Total Environment 169879, p. 2 – 3.

¹⁰⁴Rostyslav Bun and others, 'Tracking unaccounted greenhouse gas emissions due to the war in Ukraine' (2024) 914 Science of the Total Environment 169879, p. 9 – 10.

In order to address this discrepancy, it is proposed that novel standards should be introduced, which would necessitate the inclusion of military emissions in environmental reporting. Such an initiative would offer a more accurate representation of a country's environmental impact during periods of conflict.¹⁰⁵

Water Resources and Weaponization

Moreover, the existing literature explores the strategic weaponization of water resources in the context of the Russia-Ukraine conflict. Case studies from regions such as Donbas, Crimea, and Nova illustrate how water has been deliberately used as a weapon of war, exacerbating the humanitarian crisis and environmental degradation.¹⁰⁶ Examples – like the destruction of Dams and Nuclear Power Plants – show the wider environmental impact of warfare, which often goes beyond destruction. To protect the environment, we need more effective international frameworks.¹⁰⁷ Legal scholars argue that this weaponization has ecological and social consequences, especially in areas already facing water scarcity. They emphasized the necessity for international law to explicitly protect water resources as civilian assets, aligning with both IHL, ICL and IEL.¹⁰⁸

3.4.1. A practical Example: Destruction of the Kakhovka Dam 2023

A concrete example of is the destruction of the Kakhovka Dam by Russian troops in June 2023, which caused flooding and long-term ecological degradation in the Dnipro River basin.¹⁰⁹ The attack had far-reaching consequences, such as the pollution of the Black Sea and the disruption of maritime activities in surrounding coastal states such as Bulgaria, Romania, Türkiye, and Georgia – countries that are economically dependent on the Black Sea for trade and tourism.¹¹⁰ Furthermore, the sudden flooding of freshwater has had a significance alteration in the salinity level of the Black sea, potentially affecting marine biodiversity and ecosystem stability.¹¹¹

¹⁰⁵Rostyslav Bun and others, 'Tracking unaccounted greenhouse gas emissions due to the war in Ukraine' (2024) 914 Science of the Total Environment 169879, p. 10 – 11.

¹⁰⁶Ignacy Kitowski, Agnieszka Sujak and Mariusz Drygaś, 'The Water Dimensions of Russian-Ukrainian Conflict' (2023) 23 Ecohydrology & Hydrobiology 335, p. 335.

¹⁰⁷Ignacy Kitowski, Agnieszka Sujak and Mariusz Drygaś, 'The Water Dimensions of Russian-Ukrainian Conflict' (2023) 23 Ecohydrology & Hydrobiology 335, p. 338 – 340.

¹⁰⁸Ignacy Kitowski, Agnieszka Sujak and Mariusz Drygaś, 'The Water Dimensions of Russian-Ukrainian Conflict' (2023) 23 Ecohydrology & Hydrobiology 335, p. 342.

¹⁰⁹Borys Babin., Oleksii Plotnikov., & Anna Prykhodko., 'Damage to the Maritime Ecosystems from the Destruction of the Kakhovka Dam and International Mechanisms of its Assessment' (2023) 9 (5) Lex Portus, p. 23.

¹¹⁰ The Bulletin if the Atomic Scientists, 'Dam Explosion in Ukraine unleashes ecological disaster' (The Bulletin 2023): <<https://thebulletin.org/2023/06/dam-explosion-in-ukraine-unleashes-ecological-disaster/amp/>> accessed 31 May 2025.

¹¹¹ Borys Babin., Oleksii Plotnikov., & Anna Prykhodko., 'Damage to the Maritime Ecosystems from the Destruction of the Kakhovka Dam and International Mechanisms of its Assessment' (2023) 9 (5) Lex Portus, p. 23 – 24.

The floodwaters carried a toxic mix of pesticides, industrial chemicals, petroleum residues, and decaying biological matter, including dead animals and fish, further exacerbating environmental degradation in that area.¹¹² Additionally, another major impact was the destruction of the Kakhovka reservoir, a critical habitat for freshwater species. With the reservoir washed away, these species are forced into the much saltier waters of the Black Sea.¹¹³ Finally, the reservoir has been used to cool nuclear power plants like the Zaporizhzhia Nuclear Plant.¹¹⁴ Therefore, targeting such facilities could have devastating consequences on the environment in the targeted region. From a legal perspective, the above mentioned incident could potentially fall under Article (8)(b)(iv) of the Rome Statute, which prohibits acts causing “widespread, long-term and severe damage” to the natural environment. However, no prosecution has followed, due to the high evidentiary burden, challenges in proving intent, and the absence of precedent.¹¹⁵

3.5. Application of the Criteria: Ukraine

The Kakhovka Dam's destruction shows the severe ecological impacts of modern conflict. It is a useful example for the criteria mentioned earlier in this thesis. This section assesses the effectiveness of the ENMOD Convention, Additional Protocol I and the Rome Statute – using the three criteria introduced earlier in this thesis: (i) enforceability and accountability, (ii) clarity and precision, and (iii) adaptability and evolution.

3.5.1. Enforceability and Accountability

The Russia-Ukraine war highlights critical enforcement gaps in all three legal frameworks. While the Rome Statute offers the potential for individual criminal responsibility under Article 8(2)(b)(iv), no prosecutions have been brought for environmental damage.¹¹⁶ Despite the widespread destruction and significant greenhouse gas emissions caused by military operations, underscoring the limited prosecutorial reach and political constraints of the ICC.

¹¹² The Bulletin of the Atomic Scientists, ‘Dam Explosion in Ukraine unleashes ecological disaster’ (The Bulletin 2023): <<https://thebulletin.org/2023/06/dam-explosion-in-ukraine-unleashes-ecological-disaster/amp/>> accessed 31 May 2025.

¹¹³ Borys Babin., Oleksii Plotnikov., & Anna Prykhodko., ‘Damage to the Maritime Ecosystems from the Destruction of the Kakhovka Dam and International Mechanisms of its Assessment’ (2023) 9 (5) Lex Portus, p. 24.

¹¹⁴ Erika Weinthal & Carl Bruch, ‘Protecting Nuclear Power Plants during War: Implications from Ukraine’ (2023) 53 (10285) Env’t L. Rep, p. 1. See also in this regard: Joanna Przybylak, ‘Nuclear power plants in war zones: Lessons learned from the war in Ukraine’, Security and Defence Quarterly (2024) 46(2), p. 6.

¹¹⁵ Borys Babin., Oleksii Plotnikov., & Anna Prykhodko., ‘Damage to the Maritime Ecosystems from the Destruction of the Kakhovka Dam and International Mechanisms of its Assessment’ (2023) 9 (5) Lex Portus, p. 26.

¹¹⁶ *Idem*.

Similarly, Additional Protocol I provides no direct enforcement mechanisms,¹¹⁷ and its reliance on state compliance has proven insufficient to hold perpetrators of environmental degradation accountable.¹¹⁸ The ENMOD Convention's narrow scope,¹¹⁹ targeting only intentional environmental modification techniques, renders it ineffective in addressing the broader ecological consequences of conflict.¹²⁰ The failure to initiate proceedings for the Kakhovka Dam destruction, despite its extensive and documented ecological impact, exemplifies current gaps in enforcement and holding perpetrators accountable for their illegal actions. It also demonstrates that even when actions arguably meet the legal thresholds of the Rome Statute, no accountability may follow. Above that, besides the fact that representatives of the ICC Office of the Prosecutor were among the few international officials who visited the affected area from the Ukrainian-controlled side, there have been no public statements indicating that proceedings were initiated specifically under Article 8(2)(b)(iv).¹²¹

3.5.2. Clarity and Precision

The terminology used in the relevant provisions - in particular “widespread, long-term and severe” remains problematic. These vague terms appear in both Additional Protocol I and the Rome Statute and contribute to uncertainty in interpretation. For example, the threshold in Article 8(2)(b)(iv) of the Rome Statute requires that the environmental damage be “clearly excessive” in relation to the expected military advantage, a standard that could be difficult to apply objectively. This vagueness could be one of the many reasons that contribute to a lack of enforcement in practice. The discussed example underscores this challenge. While the legal threshold seems to be met in the case of the Kakhovka Dam, the lack of clarity and precision, complicates the case more than it already is. Thus, in the context of the Russia-Ukraine conflict, legal accountability remains unclear due to these definitional ambiguities.

¹¹⁷NB: Its environment protection provisions (Art 35(3), 55(1)) cannot be enforced directly. States can still interpret these however they want, and no direct accountability pathway exists.

¹¹⁸ Borys Babin., Oleksii Plotnikov., & Anna Prykhodko., ‘Damage to the Maritime Ecosystems from the Destruction of the Kakhovka Dam and International Mechanisms of its Assessment’ (2023) 9 (5) Lex Portus, p. 25.

¹¹⁹ NB: Because, I would say: the ENMOD Convention's remit is limited to environmental modification as a weapon, not a consequence. The Kakhovka Dam destruction does not involve deliberate alteration of natural processes, so it falls outside the Convention's scope. This makes it effectively unenforceable in this context.

¹²⁰ Based on the analysis of the discussed ENMOD provisions in this thesis.

¹²¹ Borys Babin., Oleksii Plotnikov., & Anna Prykhodko., ‘Damage to the Maritime Ecosystems from the Destruction of the Kakhovka Dam and International Mechanisms of its Assessment’ (2023) 9 (5) Lex Portus, p. 26.

3.5.3. Adaptability and Evolution

The destruction of the Kakhovka Dam reveals the inability of the instruments to respond to complex and layered forms of environmental harm. ENMOD, Additional Protocol I, and the Rome Statute do not account for indirect, cascading, or cross-border effects – such as changes in salinity, ecological collapse, or risks to nuclear safety. Their design seems to reflect an outdated model of warfare, focused on direct and intentional attacks, and lacks the flexibility needed to regulate contemporary conflict-driven environmental degradation.

3.6. The Sarin Attacks in Syria 2013-2017

The use of chemical weapons in the Syrian civil war shows the link between environmental damage and human suffering.¹²² These weapons can harm civilians and contaminate water, soil and air, causing long-term damage.¹²³ This destruction can make it harder for affected communities to recover and create ongoing health problems.¹²⁴ The environmental impact of the conflict complicates humanitarian assistance, which makes it more challenging to address the needs of those impacted by the conflict. The consequences of these attacks were immediate and substantial, including severe ecological devastation and significant health impacts on affected populations.¹²⁵ Despite being banned under – inter alia – the Chemical Weapons Convention (CWC),¹²⁶ and drawing global condemnation, enforcement mechanisms have proven ineffective.¹²⁷ The literature highlights that international responses to such attacks frequently prioritize humanitarian concerns over the broader ecological consequences of chemical warfare.¹²⁸ It is important to note that the CWC itself does not include any direct provisions for the protection of the environment, thus creating a significant gap in the international legal framework when it comes to addressing the environmental harm caused by

¹²²Shoham D, 'The Syrian Sarin Attacks of August 2013 and April 2017' BESA Center Perspectives Paper No. 452, 1.

¹²³Neffe MKaS, 'Collection and identification of samples contaminated with chemical warfare agents and their degradation products with the use of military equipment for detecting chemical contamination at the site of their occurrence' (2022) 71 Bulletin of the Military University of Technology 110.

¹²⁴Sommer M Quast J, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 284.

¹²⁵Sommer M Quast J, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 278.

¹²⁶Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (adopted 3 September 1992, entered into force 29 April 1997) 1974 UNTS 45. Also accessible via: www.opcw.org/chemical-weapons-convention accessed 1 March 2025.

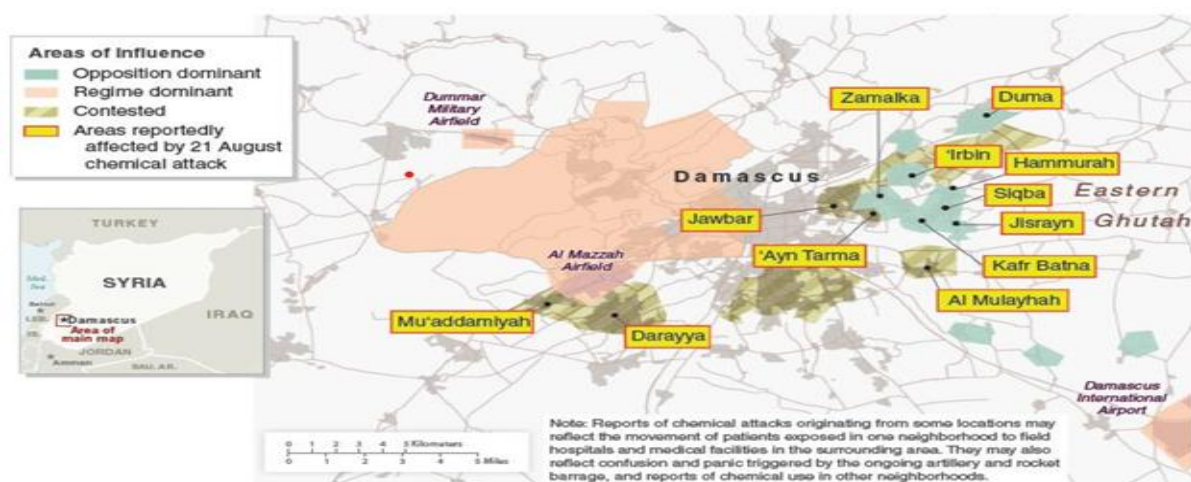
¹²⁷Rodriguez-Llanes JM and others, Epidemiological findings of major chemical attacks in the Syrian war are consistent with civilian targeting: a short report (Conflict and Health, 2018). p.1. See also in this regard: Sommer MQaJ, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 292.

¹²⁸Sommer M Quast J, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 283.

chemical weapons in armed conflicts.¹²⁹ This demonstrates that there is a necessity for improved legislation to protect both people and the environment, with a view to preventing ecological damage caused by chemical warfare. Furthermore, enhancing the effectiveness of the legislation could assist in the more effective resolution of modern conflicts in the future.

3.6.1. A practical Example: The Chemical Attacks on Ghouta 2013

A shameful case in the modern history is the chemical attack by the former Al-Assad regime on Ghouta on August 21, 2013.¹³⁰ This region, located south and east of the Syrian capital, includes around 60 villages. See the figure below for the size of the aforementioned area:¹³¹



In the literature, it has been argued that the use of chemical weapons results in significant environmental harm, including deforestation and air pollution due to toxic emissions.¹³² Having that said, the numerous and repeated attacks of the Assad regime on civilians in this region has resulted in the death of hundreds of people and caused symptoms such as shortness of breath, as reported by a UN investigation team that conducted on-site research and interviews with survivors.¹³³

¹²⁹Sommer M Quast J, 'Syria Conflict and its Impact A Legal and Environmental Perspective' (2022) 13 Journal of International Humanitarian Legal Studies 282 – 283.

¹³⁰Albert J. Mauroni, 'Eliminating Syria's Chemical Weapons' (2017) 58 The Counterproliferation Papers: USAF Center for Unconventional Weapons Studies, p. 11.

¹³¹This figure is copied from: Albert J. Mauroni, 'Eliminating Syria's Chemical Weapons' (2017) 58 The Counterproliferation Papers: USAF Center for Unconventional Weapons Studies, p. 13.

¹³²Evan Frauhiger, 'An Environmental No Man's Land: The Often Overlooked Consequences of Armed Conflict on the Natural Environment' (2018) 42 (3) William & Mary Environmental Law and Policy Review, p. 1031.

¹³³Albert J. Mauroni, 'Eliminating Syria's Chemical Weapons' (2017) 58 The Counterproliferation Papers: USAF Center for Unconventional Weapons Studies, p. 14.

The author argues that this illustrates a direct link between the use of sarin gas – and other toxic gasses – in the Ghouta area and serious air pollution resulting from that attack. Examples of such attacks goes further and further, the author names here another one with comparable consequences as those of the Ghouta attack, namely the attack on Khan al-Assal (Aleppo) in 2013 March 19th.¹³⁴ Again, Why shameful? Because not a single individual has been held accountable for either of these attacks.¹³⁵

3.7. Application of the Criteria: Syria

This section assesses the effectiveness of the ENMOD Convention, Additional Protocol I and the Rome Statute in regulating environmental harm associated with the use of chemical weapons during the Syrian civil war, namely: the sarin gas attacks between 2013 and 2017. Specifically, the attacks on Ghouta. The analysis applies three criteria introduced earlier in this thesis: enforceability and accountability, clarity and precision, and adaptability and evolution.

3.7.1. Enforceability and Accountability

Despite the clear prohibition of chemical weapons under the Chemical Weapons Convention and the Rome Statute, there has been a serious lack of enforcement and accountability.¹³⁶ Although Syria acceded to the CWC in 2013,¹³⁷ numerous credible reports and investigations – including those by the OPCW–UN Joint Investigative Mechanism – have found that the Syrian government has used sarin and chlorine gas on multiple occasions.¹³⁸ Nevertheless, no significant legal action has been taken against high-ranking offenders.¹³⁹ In theory, the Rome Statute could be used for prosecution of such acts as war crimes under Article 8(2)(b)(xviii), but Syria is not a party to the Statute,¹⁴⁰ and efforts to refer the situation to the ICC through the UN Security Council have been blocked.¹⁴¹

¹³⁴René Pita and Juan Domingo, 'The Use of Chemical Weapons in the Syrian Conflict' (2014) 2 (3) Chemical Defense Department, p. 392 – 393.

¹³⁵Piotr Pietrzak, 'Regulating Human Rights, Social Security, and Socio-Economic Structures in a Global Perspective: How did Bashar AL-Assad Get Away With the Ghouta Chemical Attack?' (2022) IGI Global, p. 132.

¹³⁶ Pietrzak (n 132) 132.

¹³⁷OPCW, 'Syria's Accession to the Chemical Weapons Convention Enters into Force' (OPCW 2013): <<https://www.opcw.org/media-centre/news/2013/10/syrias-accession-chemical-weapons-convention-enters-force>> accessed 1 May 2025.

¹³⁸United Nations, 'Secretary-General Welcomes Chemical Weapons Convention's Universal Membership' (UN Press Release DC/3651. 2016): <<https://press.un.org/en/2016/dc3651.doc.htm>> accessed 1 May 2025.

¹³⁹Voice of America, 'Decade after Sarin Gas Attack, Syrian Survivors Lose Hope for Justice' (VOA 2024): <<https://www.voanews.com/a/decade-after-sarin-gas-attack-syrian-survivors-lose-hope-for-justice-7234932.html>> accessed 1 May 2025.

¹⁴⁰Wikipedia, 'States Parties to the Rome Statute' (Wikipedia 2025): <https://en.wikipedia.org/wiki/States_parties_to_the_Rome_Statute> accessed 1 May 2025.

¹⁴¹United Nations, 'Security Council Fails to adopt Draft Resolution Referring Syrian Crisis to International Criminal Court' (UN Press Release SC/11407, 2014):

Protocol I (Art. 35 (3) and 55 (2)) prohibits methods of warfare expected to cause widespread, long-term and severe environmental damage. However, neither the ENMOD Convention nor the Additional Protocol I provide a mechanism to pursue violations or clarify if chemical contamination qualifies. With regard to the ENMOD convention, the use of sarin might not be seen as a deliberate modification of the environment, making it ineffective in this context. Thus, the lack of any meaningful accountability illustrates the inability of these frameworks to function in cases where judicial or diplomatic remedies are blocked by political barriers and interests.

3.7.2. Clarity and Precision

One of the key problems lies in the lack of legal clarity regarding the environmental dimension of chemical weapons attacks. While international law explicitly prohibits chemical warfare, the ENMOD Convention, Additional Protocol I and the Rome Statute do not clearly address the environmental consequences of such weapons. The lack of definition of what constitutes “widespread, long-term and severe” damage in cases like Ghouta and Kakhovka Dam makes it challenging.

3.7.3. Adaptability and Evolution

The use of chemical weapons in Syria highlights the outdated nature of the existing discussed instruments. ENMOD is narrowly focused on the modification of the environment as a method of warfare, but the discussed provisions do not explicitly address chemical contamination as a result of the use of weapons. Additional Protocol I and the Rome Statute also lack explicit adequate provisions to deal with the environmental consequences of chemical or toxic warfare – despite the existence of art. 8(2)(b)(xviii), the international community failed in invoking this Article. This gap reflects a broader failure of the existing regime to evolve with today's threats. In addition, neither framework contains provisions that link environmental degradation to long – term public health crises, despite the significant damage caused to ecosystems and human populations.

<https://press.un.org/en/2014/sc11407.doc.htm#:~:text=Two%20permanent%20members%20cast%20negative%20votes%20in%20the,situation%20in%20Syria%20to%20the%20International%20Criminal%20Court> accessed 1 May 2025.

3.8. Conclusion

In response to the sub-research question, this chapter has demonstrated how the case studies of the chemical attacks in Ghouta and the destruction of the Kakhovka Dam underscore both the limited effectiveness and the crucial deficiencies of existing international legal regimes in addressing environmental damage during armed conflict.

It also reflects that current legal instruments – including the Rome Statute, Additional Protocol I and the ENMOD Convention – are unable to adequately respond to the complex and evolving nature of environmental damage in modern warfare, applying the assessment criteria of enforceability and accountability, clarity and precision, and adaptability and evolution. The author argues also that even in the existence of an appropriate provision – Article 8 (2)(b)(xviii) – the international community seems unwilling to undertake any notable action. In both case studies, enforcement mechanisms proved inadequate. Despite serious violations and extensive environmental damage, meaningful legal accountability has not been achieved. Political obstacles, jurisdictional gaps and institutional limitations – such as Syria's non-ratification of the Rome Statute and Security Council vetoes - have prevented prosecutions and remedies. Even where legal tools exist in theory, such as Article 8(2)(b)(iv) of the Rome Statute, they have not been used effectively. The lack of clarity and precision in key provisions of the legislation is a further obstacle to the practical application of these frameworks. Ambiguous thresholds – such as “widespread, long-term and severe” – have made it difficult to determine the legal significance of environmental damage, thereby discouraging enforcement and weakening legal certainty. Moreover, the frameworks examined in this chapter have been demonstrated to lack the adaptability and clarity required to address contemporary threats. The author argues that this is an evident reflection of how inadequately these instruments are in addressing the environmental consequences of chemical weapons and the toxic emissions. Thus, the case studies demonstrate a considerable discrepancy between the legal protection outlined in theory and the outcomes observed in practice. This situation indicates a pressing necessity for reform, encompassing two key areas: the augmentation of legal enforcement mechanisms, and the updating of extant frameworks so that they reflect the realities of contemporary twenty-first century conflict. In the absence of such enhancements and political willingness to undertake actions, international law is likely to persist in its inability to adequately address the environmental dimensions of war, a situation that is likely to have significant consequences for both ecosystems and human communities.

These findings align with criticisms raised in broader international legal scholarship. These emphasize that enforcement-based models fall short in fragmented normative fields like environmental protection during conflict (see par. 1.3.2). there is a need for integrated, conflict-sensitive framework.

4. Chapter IV Comprehensive Proposals and Final Conclusion

4.1. Introduction

Since this chapter constitutes the conclusion of the thesis, it is important to recall the central research question and elaborate upon it. The following question is posed for discussion: *to what extent can the existing international legal frameworks effectively prevent and remedy environmental harm caused by armed conflicts, and how might these frameworks evolve to ensure accountability and environmental protection?* This chapter constitutes a consolidation of the fundamental insights derived from the preceding chapters, thereby facilitating a nuanced comprehension of the primary findings. The study reflects on the application of the developed criteria to the case studies and frameworks discussed earlier, evaluating their effectiveness and identifying areas for improvement. Drawing upon these reflections, the chapter delineates specific recommendations with the objective of enhancing the practical implementation of international legal frameworks in addressing environmental degradation during armed conflicts. Finally, the chapter explores the broader implications of these findings and acknowledging the limitations of this study.

4.2. Answering the Central Research Question: First Part

Completion of the aforementioned thesis, which evaluated the legal framework and enabled confident conclusions, showed that existing frameworks are ineffective. The ENMOD Convention, Additional Protocol I and the Rome Statute are significant environmental protection milestones in warfare, but there are gaps in their scope, definitions and enforcement preventing effective achievement of treaty objectives – In addition, while the ICRC's interpretive guidance and principles of customary international humanitarian law offer normative support for environmental protection, their impact is limited by the lack of binding enforcement mechanisms. Customary norms remain crucial for filling treaty gaps, non-international armed conflicts for instance. To illustrate this point, the ENMOD Convention is primarily concerned with issues of natural process disruption; conversely, the Rome Statute's environmental provisions remain largely unutilized, and the Additional Protocol I is hindered by ambiguous terminology (for example, the term “widespread, long-term, and severe” is unhelpfully vague, thus limiting both its application and its enforcement). Lack of enforceability and accountability: It is evident that, despite the existence of legal frameworks such as the Rome Statute and the ICRC's guidelines which provide a theoretical basis for the accountability of violators, the implementation of these frameworks has been hindered by political obstacles, jurisdictional gaps and institutional limitations.

The case studies of the sarin gas attacks in Ghouta and the destruction of the Kakhovka dam demonstrate the failure of enforcement mechanisms to hold perpetrators accountable for severe environmental harm. It is important to note that the legal landscape is further complicated by non-state actors, such as private military companies and non-state armed groups, and non-ratifying states, for example Syria. The challenges pertaining to clarity and precision are as follows: The key provisions of these legal instruments are vague, which leads to difficulties in interpreting the legal thresholds for environmental harm. This absence of clarity has the effect of weakening the capacity of international law to effectively address and remedy environmental degradation. In the context of contemporary warfare, the necessity for legal frameworks to evolve in tandem with the evolution of warfare is becoming increasingly apparent. Current provisions are inadequate in addressing the novel forms of environmental harm that have or will emerge(d). Finally, what emerges most clearly is that despite existence of Article 8(2)(b)(iv) and (xviii) Rome Statute – Protocol I and the ENMOD convention do not have an enforcement mechanism such as the ICC, that's why the author used this by way of an example – their actual application is impeded not by legal absence, but by institutional unwillingness and political blockages, as demonstrated in the Ghouta case study. This gap between law as ink on paper and law in practice reflects a broader failure of the international community to treat environmental destruction as an autonomous, prosecutable harm under international law.

4.2.1. Proposals For Improvement on The Assessment Criteria: Second Part

The evolution of existing international legal frameworks should prioritize enhancing enforcement and accountability, rather than drafting new treaties. Key actions that need to be taken to achieve that objective:

- A) Firstly, it is recommended that reforms encompass the imposition of economic sanctions on states or parties responsible for environmental harm during conflict. These initiatives should be directed towards key sectors in order to facilitate post-conflict environmental restoration. Vice versa: giving economic benefits to states/parties who comply would encourage states/parties who do not comply, to comply.
- B) Secondly, the imposition of diplomatic sanctions, including the exclusion of the state in question from international fora and the prohibition of its participation in global environmental or humanitarian platforms as well as the ban of issuing visas to its people, would serve to further increase reputational costs and signal a global stance against environmental warfare.

- C) Thirdly, selected instruments should be amended to provide clearer definitions, ensure applicability to non-state actors, and mandate environmental impact assessments in the aftermath of conflict. Simultaneously, institutional mechanisms that give customary international law and ICRC guidance more legal weight in enforcement settings should be enhanced.
- D) Finally, a funding mechanism ought to be instituted and underwritten by the responsible party, with the aim of providing immediate environmental remediation and long-term recovery. A Fund the should not be controlled by powerful states such as the US or China.

The proposals show that legal norms must be better applied and enforced. International law is effective at ensuring accountability and protecting the environment during and after armed conflict, through sanctions, exclusion, amendments and financial responsibility.

4.3. Broader Limitations and Further Research

From the author's perspective, one of the most challenging aspects of this thesis is the apparent divergence in compliance between states, such as the USA, and their "spoiled" states allies, such as, Israel, with regard to the orders issued by the ICC.¹⁴² The United States' decision to withdraw from the Paris Agreement is a significant development in the global climate change agenda.¹⁴³ This decision underlines the United States' lack of commitment to addressing the crucial issues surrounding climate change, thereby potentially exacerbating the challenges faced by the international community in combating this pressing global issue. It is also imperative to recall the veto exercised by Russia and China in the context of Syria, which further underscores the need for enhanced transparency and integrity in diplomatic relations between state administrations and individuals adversely affected by the conflict.¹⁴⁴ Besides that, in order not to lose sight of this thesis – testing effectivity of the discussed instruments in the context of environmental degradation during armed conflicts – one needs to understand the necessity of defining crucial terms within that context, such as 'non-international conflicts'.¹⁴⁵

¹⁴² Associated Press (AP), 'War-Crimes Court Issues Arrest Warrants for Netanyahu, Ex-Defense Minister and a Hamas Leader' (AP News 2025): <[War-crimes court issues arrest warrants for Netanyahu, ex-defense minister and a Hamas leader | AP News](https://apnews.com/article/war-crimes-court-issues-arrest-warrants-for-netanyahu-ex-defense-minister-and-a-hamas-leader)> accessed 4 May 2025.

¹⁴³ Associated Press (AP), 'Trump Pulls US Out of Paris Climate Agreement' (AP News 2020): <<https://apnews.com/article/trump-paris-agreement-climate-change-788907bb89fe307a964be757313cdfb0>> accessed 4 May 2025.

¹⁴⁴ Amnesty International (AI), 'UN: Russia and China's Abusive Use of Veto Shameful' (Amnesty International 2022): <<https://www.amnesty.nl/actueel/un-russia-and-chinas-abusive-use-of-veto-shameful>> accessed 4 May 2025.

¹⁴⁵ Cordula Droege, 'Get off My Cloud: Cyber Warfare, International Humanitarian Law, and the Protection of Civilians' (2012) 94 International Review of the Red Cross 533, p. 550.

With respect to the latter, there are multiple types that could have been outlined, defined, and applied in an extended manner in order to demonstrate deficiencies in their applicability and to explore the limitations of – for instance – Protocol I to the Geneva Conventions, ultimately to identify further areas for improvements. Hereby, the author argues that this is one of the limitations of this present study and at the same time, a point to build upon further research. In conclusion, while the establishment of numerous legal frameworks is possible, the prevailing interests of diplomacy and politics must be considered in contrast to humanitarian and environmental concerns. It is therefore recommended that efforts be made to encourage these powerful states to shift towards compliance, thus setting an example for other states to follow. It is the author's belief that this is the point at which the process must begin.

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