

SOME INSIGHTS ON APPLICATION OF THE INTERNATIONAL LAW TO THE DAMAGED ENVIRONMENT DURING THE WAR IN GAZA *

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Abstract: The paper deals with the environmental damage caused during the war in the Gaza Strip. The issue is mainly examined from the perspective of the international humanitarian law. The war in Gaza is perceived as an international armed conflict and thus the relevant provisions of the Additional Protocol I as well as general principles of international humanitarian law are applied.

The problem is first examined from a broader point of view and deals with the effects of military operations on the environment of Gaza as a whole, explaining which parts of the environment have been damaged. Subsequently, attention is paid to two specific cases, the alleged use of white phosphorus and the flooding of the tunnels with seawater and the impacts of these actions on the environment. Because it cannot be completely ruled out, that the environmental damage in Gaza might become a matter of concern of the ICC, the environmental damage is also marginally assessed from the perspective of the international criminal law. The paper is aimed to contribute to the academic discussion on whether and under what circumstances, it would be possible to consider the examined conduct as breaching the obligations of the state carrying out the military operations.

Keywords: Gaza Strip; serious damage to the natural environment; white phosphorus; flooding the tunnels with sea water; international humanitarian law

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INTRODUCTION

The war in Gaza has had a significant impact to the natural environment in Gaza. There is a high probability that at least some cases of the damage caused to the environment might be rather long term, while other cases might be resolved in a shorter period of time.

The objective of the paper is determining whether the damage of the natural environment in Gaza can be considered as an inevitable result of military operations. In order to meet this objective, there were formulated two research questions: *Is it possible to find that, in the defined period of first 6 months of the war and in relation to the examined military operations, the State of Israel violated its obligations under international humanitarian law in regard to the protection of the natural environment during the armed*

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conflict? Is it reasonable to assess the conduct of the military operations in Gaza and the decisions taken by the Israeli representatives according to the norms of international criminal law, specifically in relation to the war crimes against the environment?

In relation to the first question, it can be stated, that the answer would be positive in case it was proven, that the aim of the military operations carried out by the Israeli Defence Forces (IDF) was to wilfully cause the damage of the natural environment.

In relation to the second question, the author noted, that the answer would be positive in case it was proven without any doubts, that the IDF issued the orders to launch the military operations with full knowledge that the environmental damage would be widespread, long term, severe, as well as excessive compared to the military advantage anticipated. She did not find any grounds for this based on the examined cases.

Regarding the methodology used, the author employed analysis, synthesis, and comparison. Analysis was primarily used while working with the sources of information describing the military operations and the caused damage to the natural environment in Gaza. The author in this regard worked with news sources knowing that the information might not be independently verified. This was done mainly because there were not any official results of independent investigation carried out for the purpose of assessment of the situation according to the international law available at the time of this analysis. Synthesis was used to apply the rules of the international humanitarian law to the examined military operations which had the impact to the environment. A comparison was utilised to examine both similarities and differences between selected cases of environmental damage which were previously addressed in legal practise and theory.

The paper is structured in seven chapters. The first chapter explains why the author considers the war in Gaza as an international armed conflict and thus applies the norms of the international law relevant to this type of conflict. The second chapter describes the variety of impact of bombing and military operations carried out in Gaza to the natural environment. The third chapter deals with the provisions of the international humanitarian law concerning the environmental damage as a result of the armed conflict (mainly the provisions of Additional Protocol I of 1977). The fourth chapter assesses in a broader context the environmental damage in Gaza according to the general principles of the international humanitarian law. The fifth chapter is aimed at the environmental impacts of the alleged use of white phosphorus in Gaza City. The sixth chapter deals with potential environmental impacts of the flooding of the tunnels with sea water. The seventh chapter is focused on the environmental damage of Gaza from the perspective of the international criminal law. The conclusion includes the summary of the findings as well as the answer to the research questions.

1. PERCEIVING THE GAZA WAR AS AN INTERNATIONAL ARMED CONFLICT

This paper and the application of the relevant norms of international law are based on the postulate, that the war in Gaza is considered as an **international armed conflict**. This opinion is substantiated by following facts. Regardless of political state-

ments of various states recognizing Palestinian statehood, the Palestinian Authority did not yet fully develop its statehood from the perspective of international law. It can be considered as a **state in the stage of birth**, (*state in statu nascendi*) due to non-fulfilment of one of the 4 constitutive signs of statehood, which is the exercise of public authority. Every entity which strives to be considered as a state from the perspective of law, must fulfil the criteria defined by Article 1 of the Montevideo Convention,¹ which has the nature of a customary law. The exercise of public authority by the Palestinian Authority is limited by the State of Israel in the West Bank and excluded by Hamas in the Gaza Strip.

It has not yet been proven whether the Hamas was controlled by the Palestinian Authority, but it is possible to speculate that Hamas might be rather independent.² Clear and impartially verifiable finding of the existence or non-existence, duration or interruption of the bond between Hamas and the Palestinian Authority is currently hardly possible. The Palestinian Authority has claimed that Hamas got politically and ideologically separated, and the control over Hamas was lost. Hamas was originally one of the political parties in the Palestinian Authority, and it won the 2006 elections in Gaza. It was not reported that the elections were undemocratic or manipulated, the people were neither reported to be forced under the threat of violence, to vote for Hamas.³ Based on this the author assumes the Hamas is official and the regularly elected representative of the Gaza Strip, but not of Palestine as a whole. The official Palestinian representation has also been dealing with its deep internal problems, e.g., the parliament has been dissolved and the legislative power is replaced by the issuance of presidential decrees. Thus, the **Gaza Strip is considered to be Palestinian territory over which the official Palestinian government in the West Bank has lost power**. An additional reason to support this opinion is based on the fact that Israel does not consider Gaza as its own territory, Israel considers Gaza a foreign territory, against which it has been carrying out a blockade since 2007. Therefore, it is considerable viewing Gaza as a territory of the Palestinian Authority, over which the official government of the Palestinian Authority has lost control and is unable to exercise public power. This view can be also supported by recent statements by Hamas leaders that they were interested in reuniting with the Fatah government, which represents the Palestinian population in the West Bank, after the end of the war in Gaza,⁴ as well as with the statements of the Palestinian Authority Fatah's leaders who claimed that once Israel defeats Hamas's infrastructure, the Palestinian leaders would reunite with Hamas and Islamic Jihad group to rule the Gaza Strip.⁵ Finally, this perspective could be also supported by the fact that the political rivals Hamas and Fatah (which has the leading power within the Palestinian Authority), signed

¹ *The International Conferences of American States, First Supplement*. 1933–1940, p. 121.

² Doctrine of Hamas. In: *Wilson Center* [online]. [cit. 2024-06-29]. Available at: <https://tinyurl.com/mrxh68k5>.

³ PENN, M. *Japan and the War on Terror*. London: Bloomsbury Academic, 2014, p. 206.

⁴ SAWAFTA, A. – AL-MUGHRABI, N. Hamas signals post-war ambitions in talks with Palestinian rival Fatah. In: *Reuters* [online]. 5. 6. 2024 [cit. 2024-06-29]. Available at: <https://tinyurl.com/ycy4er55>.

⁵ BOB, Y. J. – LAZAROFF, T. Palestinian Authority calls for terror organization unification to rule Gaza after war. In: *The Jerusalem Post* [online]. 7. 1. 2024 [cit. 2024-06-29]. Available at: <https://tinyurl.com/2favkxhp>.

on 23 July 2024, an agreement on to form an interim national government together with another 12 Palestinian political fractions.⁶

The military wing of the Hamas movement is on the list of terrorist organizations of more than one hundred states. Some countries consider Hamas as a whole (including its political wing, which controls the internal administration and exercises all public power in Gaza) to be a terrorist organization.⁷

The Palestinian Authority might be responsible for the October 7th attack carried out by Hamas in case of the approval or recognition of the actions of civilians as acts by the official political representation of Palestine. M. Abbas made statement in which he approved the terrorist attack of October 7th, supported the Palestinians in their resistance to Israeli oppression and stated that the Palestinian people have the right to defend themselves against the terror of settlers and occupation troops.⁸ It might be challenged whether this statement has the same effects as the recognition of the Iranian government of the attack against the US embassy carried out by the Iranian civilians.⁹ In author's opinion, M. Abbas's statement does not have the equivalent effects as the declaration of the Iranian government as a whole, based on which Iran was held responsible for the conduct of the individuals, who were not directed by state authorities and did not act on behalf of the state when they attacked the embassy. The responsibility of Palestinian Authority over October 7th might be re-examined in case of new evidence demonstrating that Hamas was controlled by the Palestinian Authority and acted based on the orders of the Palestinian Authority.

Based on the above-described reasoning, the author does not apply the norms of international law relevant to the internal armed conflict and other situations of violence. In the author's opinion, there is no obstacle to examine the events of this war as an international armed conflict based on the fact that the State of Israel does not recognize Palestine as a state. Gaza is still part of the Palestinian territory, and the fact that the official Palestinian representation has lost control over this part of the territory (or claimed that they lost control over it) is not a reason for viewing Gaza as a separate entity.

2. THE IMPACTS OF BOMBING AND MILITARY OPERATIONS TO THE ENVIRONMENT

The territory of the Gaza Strip is 41 km long and 10 km wide (therefore it is an area of about of 75% size of Prague) and it has about 2.2 million inhabitants (the population density is about 6.507 inhabitants per km²). The number of inhabitants as well as the continuous growth of population in Gaza has an impact on the fact that a significant part of the Gaza territory consists of residential buildings and built infrastructure. There

⁶ CHEN, L. – AL-MUGHRABI, N. China brokers Palestinian unity deal, but doubts persist. In: *Reuters* [online]. 23. 7. 2024 [cit. 2024-07-25]. Available at: <https://tinyurl.com/m85srj27>.

⁷ Australia, Canada, Israel, Japan, New Zealand, United Kingdom and United States.

⁸ ABDEL-REZEK, O. Abbas: Palestinians have right to defend themselves. In: *Reuters* [online]. 7. 10. 2023 [cit. 2024-06-29]. Available at: <https://tinyurl.com/2y5mdu2>.

⁹ *Case Concerning U.S. Diplomatic and Consular Staff in Tehran (U.S. v. Iran)*; I.C.J. Reports, 1980, p. 3.

are parts, which form a natural environment, mainly orchards with olive, almond, date, fig, and citrus trees, agricultural land where mainly barley, wheat, and cotton are grown, and farms with greenhouses. As another example of the natural environment the Gaza Valley could be listed, which the UN planned to turn back into a natural reserve and clean it of sewage and dumped household waste and construction debris.¹⁰

The Israeli military operation in Gaza in reaction to the terrorist attacks of Hamas and some other terrorist organisations including the Palestinian Islamic Jihad on 7 October 2023, in its initial phase chose tactics of **aerial, naval, and ground bombardment**. The Palestinian civilians were urged to evacuate from the northern part of Gaza to the South. Later military operations were also carried out in the Khan Younis area and in Rafah city, in which the people previously evacuated there from North of Gaza.¹¹ The Israeli bombardment destroyed about 70% of residential properties in Gaza and damaged nearly 50% of the buildings which were part of civil infrastructure. The bombardment also caused repetitive damage of water pipelines, which resulted in the significant lowering of the water supply. The freshwater production in the desalination water facilities was affected by the shortage of fuel supplies.¹² Besides the bombardment, the IDF carried out at least 33 controlled demolitions of buildings in Gaza, which destroyed hundreds of buildings, including mosques, schools, and entire parts of residential areas. An IDF spokesman explained that they destroyed terrorist infrastructure located, among other things, inside buildings in civilian areas. He added that some neighbourhoods served as *combat complexes* for Hamas terrorists.¹³ The analysis of the satellite data concludes that *“the rate of devastation was worse than either the razing of Aleppo in Syria or Russia’s bombing of Mariupol”*.¹⁴ Besides the above-described impacts on the residential areas, the military operations had a severe impact on the natural environment.

The Israeli military operations in Gaza had impact on the production of **greenhouse gases**. The first 60 days of war generated approximately 281,000 metric tonnes of CO₂, which was compared to be the equivalent of burning at least 150,000 tonnes of coal.¹⁵

It was estimated that the bombardment of Gaza created 37 million tons of military **debris and hazardous materials**. The debris contains human remains, bombs, and military material. The debris, including toxic materials, might remain in the ground, on the surface of the land, and in the sea. It might further contaminate the soil, groundwater,

¹⁰ Pollution clean-up aims to create Gaza’s first nature reserve. In: *Times of Israel* [online]. 12. 2. 2022 [cit. 2024-01-27]. Available at: <http://tinyurl.com/2xaxs22v>.

¹¹ Bombardment in southern Gaza increases mass displacement. In: *UNRWA* [online]. 4. 12. 2023 [cit. 2024-01-28]. Available at: <http://tinyurl.com/4vF9x4df>.

¹² BABA, A. There’s a water crisis in Gaza that the end of fighting might not solve. In: *NPR* [online]. 29. 12. 2023 [cit. 2024-01-21]. Available at: <http://tinyurl.com/3v3hertc>.

¹³ ABRAHAM, L. et al. Israel’s controlled demolitions are razing neighbourhoods in Gaza. In: *The New York Times* [online]. 1. 2. 2024 [cit. 2024-02-03]. Available at: <http://tinyurl.com/2ex43yy3>.

¹⁴ FRANKEL, J. Israel’s military campaign in Gaza seen as among the most destructive in recent history, experts say. In: *AP News* [online]. 11. 1. 2024 [cit. 2024-01-21]. Available at: <http://tinyurl.com/5794c4x9>.

¹⁵ LAKHANI, N. Emissions from Israel’s war in Gaza have *immense* effect on climate catastrophe. In: *The Guardian* [online]. 9. 1. 2024 [cit. 2024-07-07]. Available at: <https://tinyurl.com/5kkn6wcz>.

surface water, and air.¹⁶ There was also reported the alleged use of **white phosphorus**, which is a hazardous material and causes air pollution.

The military operations also had a significant impact on the **sewage treatment and water management**. Part of the water and sanitation facilities were damaged during the first 3 months of the war. The destruction of water and sanitation facilities might bear a risk of flooding during the winter rains. Due to the shortage of fuel, the remaining sanitation facilities were not able to operate. The untreated sewage was directly disposed into the Mediterranean Sea, which poses a significant environmental threat. The groundwater and soil were contaminated by toxins.¹⁷

As a result of the military operations, there also occurred a massive **destruction of farmland, orchards, and forests**. This was done partially by the Israeli bombardment, partially due to the Israeli ground operations in which the tractors, tanks, and military vehicles uprooted the trees and damaged the agriculture sites, and partially by the Palestinian inhabitants who suffered between October 2023 till about March 2024 by a shortage of fuel, so they cut the trees to have wood for cooking and heating. Israel, according to some sources, is considering the creation of a military buffer zone around Gaza consisting of a system of fences and other security elements,¹⁸ which would be in the place where there are fields, orchards, and trees.¹⁹ Something similar was also reported by Egypt, however the Egyptian buffer zone would be built along the outside border of Gaza in the Sinai desert.²⁰

Waste generation, including hazardous waste (e.g., medical waste) might be considered one of the significant indirect impacts of the bombardment to the environment. Due to the war, there are difficulties in transporting the waste from some locations to **landfills**. According to some sources, there is about 3,000 tons of waste is accumulated daily which cannot be disposed due to the ongoing armed conflict and therefore there were established temporary landfills.²¹ In the winter, it was reported that the Palestinians **burnt the waste** which resulted in **air pollution**. In the spring and summer, it was reported that the decaying waste caused **soil, water, and air pollution**, which might be a long-term damage hazard.²²

¹⁶ GRAHAM-HARRISON, E. Gaza's 37m tones of bomb-filled debris could take 14 years to clean, says expert. In: *The Guardian* [online]. 26. 4. 2024 [cit. 2024-07-07]. Available at: <https://tinyurl.com/ue9ahuhn>.

¹⁷ AHMED, K. – GAYLE, D. – MOUSA, A. "Ecocide in Gaza": does scale of environmental destruction amount to a war crime? In: *The Guardian* [online]. 29. 2. 2024 [cit. 2024-07-07]. Available at: <https://tinyurl.com/4t6k34sv>.

¹⁸ ARMSTRONG, K. – BERG, R. Israel extends control of Gaza's entire border. In: *BBC* [online]. 30. 5. 2024 [cit. 2024-07-07]. Available at: <https://tinyurl.com/b2uynes9>.

¹⁹ Establishing a "security zone" in Gaza is a war crime. In: *B'Tselem* [online]. 21. 2. 2024 [cit. 2024-07-07]. Available at: https://www.btselem.org/gaza_strip/20240221_establishing_so_called_security_zone_in_gaza_is_a_war_crime.

²⁰ MURPHY, P. P. Egypt is building a new walled buffer zone, more than 2 miles wide on Gaza border, satellite images show. In: *CNN* [online]. 15. 2. 2024 [cit. 2024-07-07]. Available at: <https://tinyurl.com/y5fubesp>.

²¹ SOULAIMAN, M. Rivers of sewage, dirty water, and toxic air: The environmental disaster unfolding in Gaza. In: *Green Euro News* [online]. 21. 12. 2023 [cit. 2024-01-21]. Available at: <http://tinyurl.com/498vtfdz>.

²² A silent threat: Gaza's struggle with solid waste management. In: *UNDP* [online]. 28. 3. 2024 [cit. 2024-06-29]. Available at: <https://tinyurl.com/bdezr9t7>.

According to some opinions,²³ the war in Gaza resulted into an *ecocide*. This term was according to the International Committee of the Red Cross (ICRC) codified in penal codes of several countries in the way of “*mass destruction of the flora and fauna and poisoning of the atmosphere or water resources, as well as other acts capable of causing an ecological catastrophe*”.²⁴ Applying the term of ecocide to the situation in Gaza refers not only to the severe damage of the natural environment, but it also reflects the opinion that the military operations were not carried out in accordance with law, and it emphasises on the potential element of criminal responsibility.²⁵

3. THE ENVIRONMENTAL DAMAGE A RESULT OF THE MILITARY OPERATIONS IN THE PERSPECTIVE OF THE INTERNATIONAL HUMANITARIAN LAW

The Additional Protocol I to the Geneva Conventions (AP I) in Article 35(3) prohibits the use of “*methods or means of warfare which are intended, or may be expected to cause, widespread, long-term and severe damage to the natural environment*”. In Article 55(1) it stipulates that: “[C]are 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.” And finally in (2) it rules that “*attacks against the natural environment by way of reprisals are prohibited*”.²⁶

The ICRC commented that these provisions were clearly new when they were adopted, but since then, significant practice of states has emerged to the effect that this prohibition has become customary. Based on this finding, these articles are thus generally binding even to the states that are not state parties of the AP I. This opinion is supported by the ICRC and also by several states within their submissions to the International Court of Justice in the Case of *Nuclear Weapons*. The states acknowledged that they considered the rules in Articles 35(3) and 55(1) of AP I to be customary.²⁷ The Report on the Practice of the State of Israel, which is not a party to AP I, was consistent with this opinion because it stated that the Israeli Defence Forces do not utilize or condone the use of methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the environment.²⁸

²³ JOHNSON, J. Report: Deliberate Ecocide a Key Element of Israel’s Genocidal Campaign in Gaza. In: *Truthout* [online]. 29. 3. 2024 [cit. 2024-07-07]. Available at: <https://tinyurl.com/2p9ytuas>.

²⁴ HENCKAERTS, J. M. – DOSWALD BECK, L. *Customary International Humanitarian Law. Vol. II*. Cambridge: Cambridge University Press, 2005, pp. 143–158.

²⁵ “No traces of life”: Israel’s ecocide in Gaza 2023-2024. In: *Forensic Architecture* [online]. 29. 3. 2024 [cit. 2024-07-07]. Available at: <https://tinyurl.com/y82pww8f>.

²⁶ Protocol Additional to the Geneva Conventions of 12 August 1949 and relating to the Protection of Victims of International Armed Conflicts (Protocol I). 8 June 1977.

²⁷ Legality of the Threat or Use of Nuclear Weapons; I.C.J. Reports, 1996 (Advisory Opinion), p. 226.

²⁸ HENCKAERTS et al., c. d.

A violation of this customary rule of IHL might be obvious in case the state had knowledge or there can be an inference that “*a certain method or means of warfare will or probably will cause widespread, long-term and severe damage to the environment. In relation to another customary rule stipulating ‘the due regard for the natural environment in military operations’²⁹ the states engaged in the military operations ‘are obliged to obtain the information of the potential results of their planned actions and to refrain from actions that could be expected to cause widespread, long-term and severe damage to the environment’.*”³⁰ The violation of this rule would be in case the states wilfully caused widespread, long term, and severe damage to the natural environment. In the ICRC Study on Customary IHL it was also stated that: “[I]t is not easy to know in advance exactly what the scope and duration of some environmentally damaging acts will be; and there is a need to limit as far as possible environmental damage even in cases where it is not certain to meet a strict interpretation of the criteria of widespread, long-term and severe.”³¹ Determining whether the rate of the environmental destruction crossed the threshold due to the armed conflict might be possible through the provisions of the international criminal law.

4. ASSESSMENT OF ENVIRONMENTAL DAMAGE IN GAZA ACCORDING TO THE RELEVANT PRINCIPLES OF INTERNATIONAL HUMANITARIAN LAW

The military operations in Gaza had a direct impact on carbon emissions. Based on a study aimed at the Greenhouse Gas Emissions from the Israel-Gaza Conflict, there was estimated the total emissions from the conflict amounted to 281,315 tons of carbon dioxide in the initial phase of the war. This number included the combined emissions of bombs, rockets, and artillery, as well as munitions shipments delivered by cargo jet. According to this study, the greenhouse gas emissions from the first 60 days of the war were “*roughly the equivalent of 75 coal-fired power plants operating for a year*”.³² There was reported that the IDF used the Besorah system, an AI platform programmed to suggest the targets of the bombardment based on the data available. Opinions emerged stating that during the war in Gaza, the Besorah system was allegedly set up in the way that it prioritised quantity, over the quality of targets. The IDF was criticised for targeting large areas by bombing with little focus on specific targets.³³ There was also reported that the IDF, while launching the ground operation, entered Gaza through the natural zones in Gaza. Assessing whether it was possible to carry out

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

³² NEIMARK, B. – BIGGER, P. – OTU-LARBI, F. – LARBI, R. A Multitemporal Snapshot of Greenhouse Gas Emissions from Israel-Gaza Conflict. In: *SSRN* [online]. 9. 1. 2024 [cit. 2024-07-21]. Available at: <https://tinyurl.com/rawz5yry>.

³³ D’EVEREUX, V. Israeli Military Artificial Intelligence, Its Possible Use in the War in Gaza. *Obrana a strategie* [Defence and Strategy]. 2024, Vol. 24, No. 1, p. 129.

the military operations in a way which was more considerate to the environment is possible through applying relevant general principles of the international humanitarian law.

The **principle of military necessity** permits the use of such weapons as permitted by law and to the extent necessary to achieve the purpose of the war in the shortest possible time and with the least possible impact on human life and material resources. The belligerents may use only such means that are absolutely necessary to force the enemy to surrender. Disregarding this principle leads to disproportionate destruction which is prohibited by international humanitarian law and might be also considered as a war crime.³⁴

As far of this principle concerned, the State of Israel might be challenged on whether **the extent as well as the way of conducting the military operations**, with regard to their environmental impacts, was **necessary to achieve the goal of the war**. The bombardment had an impact on carbon emissions, resulting in debris, part of which got contaminated. As a result of the bombardment, the majority of the population resettled, which resulted in the generation of waste, that could not be safely and adequately disposed of in landfills due to ongoing military operations. The principle of military necessity, however, must not be interpreted as a reason for violating the law of armed conflict. It is likely that the issue of the State of Israel's operations according to this principle will be the subject of further investigation, which the author considers reasonable. The outcome of the investigation will probably also partially depend on the final outcome of the war in Gaza. However, based on the previous experience of military operations in Gaza, it is possible that both sides of the conflict may hypothetically declare contradicting information. Therefore, the result of this war might also be unclear. If Israel were to end operations at a time when it believed that Hamas was no longer capable of fighting, it is possible that the other side would claim otherwise. An independent examination of the real ability or inability to fight of the Hamas movement is very difficult due to the fact that most of their military resources are hidden underground and even the State of Israel therefore has only partial information about it.

The **principle of distinction** requires a distinction to be made between military objects that are legitimate war targets and civilian objects that need to be spared from attack.³⁵

In relation to this principle, in the perspective of the environment, the range of the bombardment might be challenged. Specifically in regard to the current uncertainty whether all the targets had a military nature and whether it was possible to reach the similar results with a lower carbon emission and avoiding unnecessary damage at the same time, so there would be less of building destruction, and less debris. On the other hand, it probably would not have an impact on the issue of the generation of waste, because civilians would probably either way evacuate based on the knowledge that the bombing would take place in the area. The principle of distinction might also apply to the ground operations and the choice of routes for the military vehicles. In case the IDF

³⁴ O'ETER, S. *Methods and Means of Combat*. In: FLECK, D. (ed.). *Handbook of International Humanitarian Law*. 2nd ed. Oxford: Oxford University Press, 2008, p. 127.

³⁵ KOLB, R. – HYDE, R. *An introduction to the International Law of Armed Conflicts*. Oxford, Portland, Oregon: Hart Publishing, 2008, pp. 45–46.

commanders had to choose whether it is necessary for the passage of military equipment to damage civilian infrastructure or natural zones, it might be necessary to prioritise protection of the civilians over the protection of nature. The damage of the environment might be also justified in case there were hidden entrances to the tunnels in the orchards, farmland, greenhouses etc. Any damage to these entrances could be considered as essential, so Hamas fighters were not able to use it as military advantage.

The **principle of proportionality** means that the losses and damages caused by military operations must not be disproportionate to the results that were achieved. The military advantage must outweigh the damage caused. Military operations are to be conducted in a manner that avoids disproportionate and accidental damage and loss.³⁶

For this reason, the states must aim to minimise the damage to the natural environment and to carefully weight out, whether the result of the operation is proportional to the damage caused. There is no doubt that the destruction of the Gaza Strip is enormous. In the author's opinion, the damage of the natural environment in Gaza was an **inevitable result of immediate combat**. The fight against Hamas is very specific due to their **spread across Gaza as a whole**. From the perspective of the State of Israel, the aim of the operation was to **expel the fighters of the Hamas movement from their positions**. Some observers however interpreted the IDF operations as **scorched-earth policy**, which is not only a violation of international humanitarian law, but it also may establish the criminal responsibility of the commanders responsible for issuing the relevant orders and their implementation. The grounds for these opinions lies in the extent of the destruction of the Gaza Strip as a whole, including the destruction of natural sources which are necessary to contribute³⁷ to the survival of civilian population.³⁸ On the contrary, in the opinion of the author, it is not correct to consider the scorched-earth policy being applied to Gaza due to the fact that this policy is rather a purposely ordered strategy, which is supposed to make it impossible, for resources to become available for use by the enemy or by the civilians in the near future. Thus, this pre-planned strategy is aimed to hinder the enemy's ability to advance or purposefully cause a risk to the survival of the civilian population. Therefore, the author finds the term scorched-earth policy to be incorrectly used because the stage of Gaza's destruction rather corresponds to the indirect consequences of the military operations.

³⁶ NEUMAN, N. *Applying the Rule of Proportionality: Force Protection and Cumulative Assessment in International Law and Morality*. The Hague: T. M. C. Asser Press, 2004, Vol. 7, p. 84.

³⁷ The word *contribute* reflects the long-term dependency of Gaza on humanitarian aid, and the inability of Gaza to striving to be self-sufficient as much as possible in relation to food production.

³⁸ FERNANDEZ, B. Israel is taking scorched earth policy to a new level. In: *Al Jazeera* [online]. 16. 12. 2023 [cit. 2024-01-29]. Available at: <http://tinyurl.com/mv4dzs4b>.

5. THE ENVIRONMENTAL IMPACTS OF ALLEGED USE OF WHITE PHOSPHORUS IN GAZA CITY

White phosphorus is a chemical substance which is not prohibited under the *Chemical Weapons convention*.³⁹ White phosphorus can be used either for marking, signalling, but also for obscuring because it creates smoke which hides some military actions. The use of white phosphorus is restricted in densely populated areas, because it is a hazardous material which pollutes the air, creates heat, and has incidental burning effect, so there is a risk of spontaneous combustion involved with it. The use of white phosphorus is also stipulated in war manuals of several states, e.g., the U.S. Department of Defence in their Law of War Manual state that, “*white phosphorous is a munition [...] that is intended primarily for marking or illuminating a target or masking friendly force movement by creating smoke*”.⁴⁰

Some NGOs, Human Rights Watch (HRW), stated that they hold evidence that the Israeli army used **white phosphorus** on 11 October 2023 in Gaza City,⁴¹ and on 10 October at the border with Lebanon.⁴² Amnesty International stated that they hold evidence of the use of white phosphorus on the border with Lebanon and in Gaza by Israel. The State of Israel officially denied that they “*deployed the use of such munitions*”, and stated the accusation as well as the evidence of it is unequivocally false.⁴³ The IDF further stated that “*in accordance with international law, this type of weapon is not used by the Israel Defence Forces against the terrorist group Hamas*” and claimed that the report of use of white phosphorus was taken from another war.⁴⁴

A theoretical assessment of the questions related to use of white phosphorus in Gaza might be challenging because there is not yet available the unequivocal conclusions of an impartial investigation. Mainly, there are available statements of some NGOs protecting the interests of the Palestinians and advocating for them, and the statements of the IDF denying these accusations.

Examining whether the photographs and videos, which, based on the statements of these organisations, showed that the IDF allegedly used white phosphorus in Gaza

³⁹ United Nations Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects (and Protocols) (As Amended on 21 December 2001), 10 October 1980, 1342, UNTS 137.

⁴⁰ COBLE, K. S. – TRAMAZZO, J. C. Israel – Hamas 2023 symposium – white phosphorus and international law. In: *Lieber Institute West Point* [online]. 25. 10. 2023 [cit. 2024-02-02]. Available at: <http://tinyurl.com/mtf5d3s3>.

⁴¹ Israel: White phosphorus used in Gaza, Lebanon, Use in populated areas, grave risk to civilians. In: *Human Rights Watch* [online]. 12. 10. 2023 [cit. 2024-01-21]. Available at: <http://tinyurl.com/5x8c7xau>; Questions and Answers on Israel’s use of white phosphorus in Gaza and Lebanon. In: *Human Rights Watch* [online]. 12. 10. 2023 [cit. 2024-02-02]. Available at: <http://tinyurl.com/ykw88jys>.

⁴² Lebanon: Evidence of Israel’s unlawful use of white phosphorus in southern Lebanon as cross-border hostilities escalate. In: *Amnesty International* [online]. 31. 10. 2023 [cit. 2024-02-02]. Available at: <http://tinyurl.com/mv56kwyw>; Israel / OPT: Identifying the Israeli army’s use of white phosphorus in Gaza. In: *Amnesty International* [online]. 13. 10. 2023 [cit. 2024-02-02]. Available at: <http://tinyurl.com/mr2nk2hd>.

⁴³ WINTOUR, P. Israel denies using white phosphorus in Gaza. In: *The Guardian* [online]. 13. 10. 2023 [cit. 2024-01-21]. Available at: <http://tinyurl.com/3vd7kubs>.

⁴⁴ NGOs accuse Israel of using white phosphorus munition in Gaza – but what are they? In: *France24* [online]. 15. 10. 2023 [cit. 2024-02-02]. Available at: <http://tinyurl.com/5fdjnbj>.

City, were authentic, cannot be the subject of a legal research. Rather it is a matter of a different area of expertise. There can be several variants of the future outcomes of the independent investigation in this matter, including finding out that it was not possible to verify whether this substance was used.

It is a fact that in 2009, during Operation Cast Lead in Gaza, the IDF admitted the use of white phosphorus to **mark targets**. The later report of the military inquiry stated, that at that time, the white phosphorus munition was intended for use only for **smokescreen** purposes. It was used as a **camouflage**, which is not considered as an **incendiary weapon**. The report also stated that the white phosphorus was used while balancing the military necessity and in regard to the obligations stemming from the humanitarian law.⁴⁵

In 2013, the IDF responded to a petition to Israel's High Court of Justice concerning the use of white phosphorus in Gaza. The Israeli military stated that they "*would no longer use white phosphorus in populated areas except in two particular situations*". The details about these two exceptions were not published. Judge E. Arbel further explained that the IDF should "*render use of white phosphorous an extreme exception in highly particular circumstances*".⁴⁶

For the purpose of examining whether the allegedly used white phosphorus could be considered a violation as humanitarian law because of the environmental damage, mainly in the form of the air pollution, there can be made a comparison with the case of chemical factory in Pancevo, which was hit by a NATO bombing campaign. The background of these two circumstances is different, but in both cases, it is related to the **environmental damage caused by the chemical substances in connection with a military attack**. The *Pancevo* case, which had a **massive and long-term environmental impact**,⁴⁷ was resolved by the ICTY Prosecutor. It was stated that the environmental damage "*did not reach the Additional Protocol I threshold*" and that "*long term damaged would need to be measured in years, rather than months*".⁴⁸

Given the fact that the white phosphorus is not one of the chemical substances prohibited by the international treaties, it is possible to debate about the alleged use of this chemical substance by the IDF in Gaza City in the context of a general prohibition of certain methods of warfare. Specifically in connection the **principle of the prohibition of indiscriminate attacks and principle of proportionality**. Additionally, in connection to the **prohibition of severe damage of the natural environment** (Article 55 AP I). In order to assess the question of compliance of the alleged use of white

⁴⁵ Military rejects horrific results of use of white phosphorus in Operation Cast Lead. In: *B'Tselem* [online]. 21. 5. 2009 [cit. 2024-02-02]. Available at: <http://tinyurl.com/59kmja69>.

⁴⁶ Incendiary weapons: Recent use and growing opposition. Memorandum to Convention on Conventional Weapons delegates November 2014. In: *Human Rights Watch and International Human Rights Clinic* [online]. November 2014 [cit. 2024-02-02]. Available at: <http://tinyurl.com/ycynmpnu>.

⁴⁷ JANKUV, J. *Environmentalizácia medzinárodného práva verejného a jeho vplyv na právo Európskej únie a právny poriadok Slovenskej republiky* [Environmentalisation of the public international law and its impact to the European Union law and the legal order of the Slovak Republic]. Prague: Leges, 2021, pp. 268–270.

⁴⁸ Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia. In: *ICTY* [online]. [cit. 2024-02-02]. Available at: <http://tinyurl.com/4rt26aae>.

phosphorus in Gaza city with international law, it might be necessary to consider the **factual impacts** of the effects of this chemical substance in this territory. There should be considered the question of proportionality in relation to the **degree, severity, and duration** of the imminent medical complications, and the aim of the IDF operations. It might also be relevant to find out whether the amount of the white phosphorus allegedly used by the IDF had such effects, that it could cause widespread, severe, and long-lasting damage to the environment. In analogy with the case of *Pancevo*, in which the duration of the damage was decisive, it is important to examine whether the **overall effects** of alleged use of white phosphorus in Gaza would take years, rather than months. In author's opinion, there is a minimum probability that the damage mainly in the form of air pollution due to the alleged use of white phosphorus in Gaza City crossed a threshold stipulated in Article 55 of AP I as the air pollution, as reported lasted for only a couple of days.

6. THE POTENTIAL ENVIRONMENTAL IMPACTS OF FLOODING THE TUNNELS WITH SEA WATER

The network of the underground tunnels in Gaza was constructed by Hamas with three purposes. First, for smuggling weapons and commerce between Gaza and Egypt. Second, for defensive purposes, from which benefit the Hamas commanders (not Gaza civilians), the tunnels are also used as weapons storage, thus the tunnels can be considered a great military advantage. Third, for offensive purposes which allows the cross-border attack against Israel. These tunnels have concrete walls and roofs, they have electricity and other equipment, which is used for the benefit of the Hamas terrorist, not for the benefit of the protection of the civilians of Gaza. These tunnels are not used by civilians as bomb shelters. At the beginning of war in Gaza in October 2023, it was estimated that there were about 1,300 tunnels with a total length of about 500km in Gaza. It might take around 1.5 million cubic metres of water to completely fill the tunnels.⁴⁹

In December 2023, the IDF declared the intention to flood the tunnels with sea water and set up first pumps at the Al-Shati refugee camp. It was reported that the IDF started the trial of pumping the water into the tunnels in order to drive Hamas's terrorists above the ground and make it impossible for them to use their significant strategic tool.⁵⁰ In January 2024, it was confirmed that Israel had been flooding some tunnels with sea water and before doing so, the IDF carried out *professional and comprehensive*

⁴⁹ GAYLE, D. – LAKHANI, N. Flooding Hamas tunnels with sea water risks 'ruining basic life in Gaza', says expert. In: *The Guardian* [online]. 23. 12. 2023 [cit. 2024-01-24]. Available at: <http://tinyurl.com/3chpxz7v>.

⁵⁰ STAFF, T. Report: The IDF has begun pumping sea water into tunnels. In: *The Times of Israel* [online]. 12. 12. 2023 [cit. 2024-07-21]. Available at: <https://tinyurl.com/28xdauv7>; EBRAHIM, N. Israel is testing out flooding the Hamas tunnels. Here is what it could look like scaled up. In: *CNN Middle East News* [online]. 15. 12. 2023 [cit. 2024-01-24]. Available at: <http://tinyurl.com/y2jbbz7a>.

pre-emptive checks, including an analysis of the soil and water system in the area, to ensure groundwater did not get contaminated.⁵¹

In accordance with **the precautionary principle** IDF commanders have to **continuously evaluate** the variants of the next course of further operations against terrorists during the ongoing conflict. Using the method of combat of flooding the tunnels has certain risks, and it is necessary to also consider them all in order to assess the question of its legality, in connection to the **imminent damage** to the environment.

Prof. Zeitoun mentioned that *“seawater pumped into the hundreds of kilometres of tunnels crisscrossing the porous, sandy soil of Gaza would inevitably seep into the aquifer that its 2.3 million residents rely on for about 85% of their water”*. He further explained that *“the contamination would be such that current neighbourhood-level reverse osmosis desalination methods used by Palestinians in Gaza to treat their water would no longer be feasible”*. Prof. Zwijnenburg mentioned another environmental risk related to flooding the tunnels. There might be over 75,000 litres of fuel stored in the tunnels and *“all those kinds of hydrocarbons that can potentially also affect the soil and get into the aquifer and groundwater”*. He also warned that flooding the tunnels would *“pose risks for the integrity of the ground on which the communities of Gaza, the world’s most densely populated territory, are built. If they were to collapse beneath built-up areas, that could bring whatever buildings remain above them down as well”*.⁵²

It was also reported that the IDF used explosives and a *blast-gel* to detonate the tunnels in Gaza.⁵³ According to some (unverified) sources, the IDF might also have *sponge bombs* which is a chemical substance creating an expanding foam which hardens and blocks off the tunnels.⁵⁴ For this reason, the author assessed this method of warfare, which might have environmental dimension, in a broader perspective.

Article 55(1) of AP I refers to the obligation of the state to *“take care to protect the natural environment”* against damage and it prohibits the use of the methods which *“are intended or may be expected”* to cause such damage. Therefore, this stipulation can be interpreted as the obligation of the state to **foresee the possible consequences** of used methods of warfare and their impact to the environment. The way this provision is phrased could therefore rule out the potential argument, that the aim of flooding the tunnels was not to destroy Gaza’s environment, degrading the agricultural land, and water resources (or land subsidence, which subsequently caused the collapse of residential buildings and thus more potentially contaminated debris). But that the purpose of this method was rather to **fight Hamas by depriving them of their military advantage**. This way of understanding of the above-mentioned Article 55(1) AP I might be, in author’s opinion, in accordance with the **precautionary principle**, which as prof. Jankuv states, is interpreted in different ways. Part of the theory of international law, gradually

⁵¹ FABIAN, E. IDF Confirms flooding Hamas tunnels with sea water. In: *The Times of Israel* [online]. 30. 1. 2024 [cit. 2024-07-21]. Available at: <https://tinyurl.com/kva9ssmv>.

⁵² Ibid.

⁵³ WILLIAMS, D. With mapping robots and blast gel, Israel wages war in Gaza tunnels. In: *Reuters* [online]. 17. 11. 2023 [cit. 2024-01-24]. Available at: <http://tinyurl.com/bdcpaxxf>.

⁵⁴ Sponge bombs are Israel’s new secret weapon to block Hamas tunnels. In: *The Telegraph* [online]. 25. 10. 2023 [cit. 2024-01-24]. Available at: <http://tinyurl.com/yc7v8vts>.

begins to perceive this principle as a part of international customary law. However, there are also opinions which do not yet see it as a binding rule because some states are still hesitant to consider this principle as a legally binding rule for their behaviour.⁵⁵ As prof. Šturma states, one of the ways of how this principle can be interpreted is as follows. The states should give up their activities, which could cause harm to the environment, even if the expertise is unable to prove, what would be the measure of the related risks.⁵⁶ In author's opinion, this principle could hypothetically be considered as a part of customary law, therefore not merely as one of the risk management approaches, stipulated in the Report of the UN Conference on Environment and Development in 1992,⁵⁷ (this document is applicable to the economic activities of the states, and it was not considered to be applied in the armed conflict). Enabling such theoretical perception might make it possible to use this principle **in a broader sense** of interpretation. There can be made a hypothetical consideration of flooding the tunnels in relation to this principle, according to which, if there is a possibility that an action might cause harm to the environment, and if there is no expertise on the issue yet, the action should not be implemented. The intended measures can be reviewed when expertise becomes available. Therefore, according to this principle, Israel should carefully consider the impacts of flooding the tunnels and obtain expert opinions in advance, take into account all the risks, their level and the options for preventing them and minimising them. This approach would also be in accordance with Article 35(3) AP I, which **prohibits to use military measures which can be expected to cause damage to the environment**.

Flooding the tunnels with sea water might harm to the natural environment in Gaza, mainly soil and groundwater pollution. Considering the fact that the tunnels are most probably located under the significant part of the territory of the Gaza Strip, the damage might be relatively extensive, however it might be rather uncertain, whether there is a real risk that the threshold of environmental damage might be crossed.

7. ENVIRONMENTAL DAMAGE IN THE PERSPECTIVE OF THE INTERNATIONAL CRIMINAL LAW

Crimes damaging the **natural environment** can be found in the Statute of the International Criminal Court (ICC) Article 8(2)(b)(iv) according to which a serious violation of the laws and customs applicable in international armed conflicts takes places in case of “*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*”. Another provision with an environmental dimension, related to the protection

⁵⁵ JANKUV, *c. d.*, pp. 88–90.

⁵⁶ ŠTURMA, P. – ČEPELKA, Č. *Mezinárodní právo veřejné* [Public international law]. 2nd ed. Prague: C. H. Beck, p. 207.

⁵⁷ A/CONF.151/26/REV.1 (Vol. 1) Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992.

of the natural environment, can be found in Article 8(2)(b)(xvii), which *prohibits the use of poison and poisonous weapons*. These substances can be released into the air, soil and water and thus cause ecological damage.⁵⁸

Prof. Jankuv states that the **cumulative fulfilment of all the individual components of the characteristics of the crimes** described above is so difficult in practice, that one can hardly assume the successful application of this ban.⁵⁹ As an example, there can be noted the interest of the ICC in punishing the former president of Sudan, *Omar Hassan Ahmad Al Bashir*,⁶⁰ who was accused of destroying food, wells, wells, crop warehouses, cattle stables, and other infrastructure necessary for the survival of civilians in the Darfur region. He also demonstrably stated that he did not wish to preserve any villages. He issued orders for a procedure leading to the creation of a scorched earth.⁶¹

It is therefore clear, that the **prosecution of crimes damaging the environment in connection with the armed conflict is theoretically possible** in several ways. It is feasible to assess the conduct, the result of which stemmed into the serious environmental damage, based on the general definition of war crimes, i.e., the *“use of certain means and methods of warfare which cannot be considered as military necessity”*. This is applicable if the *“environmental damage caused serious threats to the health or survival of the population”*.⁶² The other option is to assess the conduct based on the definition of war crimes, which strictly *“prohibits the unjustified destruction of the enemy’s property, or which stipulates the prohibition of use of some types of weapons”*. It is also possible to prosecute environmental crimes which occurred during an armed conflict, if the damage to the environment took place *“in connection with the crime of genocide or crimes against humanity”*.⁶³

Nevertheless, the prosecution of crimes against the environment in practise of the ICC might be still very difficult because of the interpretation of the **principle of proportionality** in relation to Article 8(2)(b)(iv) of the Rome Statute. In the context of most cases the prosecutors found that the threshold of the *“widespread, long-term and severe damage”* was not crossed. The interpretation presented by prof. Gillett is useful.⁶⁴ The term **widespread** is based on the geographical scope of the environmental

⁵⁸ United Nations. Rome Statute of the International Criminal Court. Treaty Series, Vol. 2187, No. 38544.

⁵⁹ JANKUV, c. d., p. 272.

⁶⁰ *The Prosecutor v. Omar Hassan Ahmad Al Bashir ICC-02/05-01/09, Pre-trial.*

⁶¹ SMITH, T. Creating a Framework for the Prosecution of Environmental Crimes in International Criminal Law. In: SCHABAS, W. – MCDERMOTT, Y. – HAYES, N. – VARAKI, M. (eds.). *Companion to International Criminal Law: Critical Perspectives*. London: Ashgate Publishers, 2012, p. 6.

⁶² BIRNE, P. – BOYLE, A. – REDGWELL, C. *International Law and the Environment*. 3rd. ed. Oxford: Oxford University Press, 2009, p. 330.

⁶³ ŠTURMA, P. *Mezinárodní trestní soud a stíhání zločinů podle mezinárodního práva* [The International Criminal Court and the prosecution of crimes under international law]. Prague: Charles University in Prague, Karolinum, 2002, pp. 132–133.

⁶⁴ GILLETT, M. Eco-Struggles: Using international criminal law to protect the environment during and after non-international armed conflict. In: STAHN, C. – IVERSON, J. – EASTERDAY, J. S. (eds.). *Environmental Protection and Transitions from Conflict to Peace: Clarifying Norms, Principles, and Practices*. Oxford: Oxford Academic Press, 2017, pp. 228–229.

damage, and in terms of its size, it may vary between several hundred⁶⁵ to thousands⁶⁶ of square kilometres. This interpretation is available as a source of opinion concerning the international humanitarian law, specifically in the background materials concerning AP I. The term **long-term** refers to the temporal duration of the environmental damage, the minimum duration is undetermined by law. It could vary from a period of several months or a season,⁶⁷ to a period of decades.⁶⁸ The term **severe** refers to the intensity of the damage caused to the environment, and it is independent of its geographic ambit, or temporal duration. Severe environmental damage denotes harm which goes beyond typical battlefield destruction.⁶⁹ Prof. Marauhn noted that the general rule, which orders the belligerent parties to prevent the environmental damage, might (due to the high requirements stipulating the extent of the damage) deprive these criminal law provisions from their deterrent effect.⁷⁰

Based on the above-mentioned interpretation it might be rather uncertain, whether there can be found the **cumulative fulfilment** of all three features in relation to the damage to the natural environment in Gaza Strip. On one hand, it might require the considerations within the lower variant of the presented limits. If we were to insist on the higher variant of the presented limits in regard to the widespread aspect, this would *a priori* rule out the applicability of this provision because the size of the territory of the Gaza Strip is only approx. 365 km². On the other hand, assessing the widespread damage based on square kilometres might be rather inappropriate in relation to the generally small territorial units. Thus, there could be hypothetically considered the possibility of assessing the widespread aspect based on ratio or percentage.

CONCLUSION

In conclusion it can be stated that the damage of Gaza due to the war is excessive. However, a similar adjective could be used to describe the military capacities of Hamas. The war certainly has had impacts on the environment. It is possible to express the opinion that the IDF should have carried out some of their military operations more precisely. On the other hand, it might be beyond the realistic possibilities for the IDF to fight Hamas and at the same time to ensure that there would be no side effects of the military operations. This might be realistic, if Hamas terminated their activities, and surrendered to criminal prosecution.

⁶⁵ Convention on the Prohibition of Military or any Hostile Use of Environmental Modification Techniques 1976 (ENMOD Memorandum of Understanding). Reprinted in ROBERTS, A. – GUELFF, R. (eds.). *Documents on the Law of War*. 2nd ed. Oxford: Clarendon Press, 1989.

⁶⁶ PETERSON, I. The natural environment in times of armed conflict: A concern for international war crimes law? *Leiden Journal of International Law*. 2009, Vol. 22, No. 2, pp. 331–332.

⁶⁷ Art. 1 ENMOD Memorandum of Understanding.

⁶⁸ Art. 35(3) and 55 Additional Protocol I. to Geneva conventions.

⁶⁹ Travaux préparatoires to Art. 35(3) of Additional Protocol I. to Geneva conventions.

⁷⁰ MARAUHN, T. Environmental damage in times of armed Conflict – not “really” a matter of criminal responsibility? *International Review of Red Cross*. 2000, Vol. 82, No. 840, p. 1036.

In relation to the first research question aimed at finding out whether the State of Israel violated its obligation under the IHL in regard to the protection of the natural environment, the following answer can be offered. In author's opinion, the positive answer could be given in case it was proven, that the aim of the military operations carried out by the IDF was to wilfully cause the damage of the natural environment. However, it is uncertain, whether the damage caused to the environment could have been minimised if the operations were carried out more precisely. Given the fact that the terrorist infrastructure is widespread in Gaza, it is uncertain if the lesser extend of the bombardment (so it would generate less of carbon emissions and less of debris, some of which might be treated as hazardous material) would bring the equivalent military advantage for the IDF. In author's opinion planning the carbon emissions was probably not a primary part of the IDF military strategy, however it might be advisable to progressively change this practice. It is possible that military manuals will be gradually updated, and this question will also become more relevant in the future practice of warfare. This trend can be already reflected e.g., in the US and EU policy. The waste treatment might be particularly challenging in Gaza as it is not unusual for Hamas to misuse civilian vehicles, including ambulances and the vehicles carrying humanitarian aid. Thus, this might be necessary for the IDF to assess the degree of this risk as Hamas could potentially misuse a garbage truck to attack IDF units operating in the area. In regard to the alleged use of white phosphorus, it only resulted to a minimum air pollution. Flooding the tunnels with sea water might be relatively risky, however the IDF claimed that the tunnels which were selected to be flooded were carefully examined and based on the results of the examination, the tunnels were chosen as suitable to be flooded. The author is rather inclined to state that in regard to the examined areas of damage, the threshold defined by international humanitarian law was not crossed.

In relation to the second research question focused at examining the conduct of the military operations according to the norms of international criminal law, the following answer can be offered. In author's opinion, the positive answer could be given in case it was proven without any doubt, that the IDF issued the orders to launch the military operations with a full knowledge that the environmental damage would be widespread, long term, severe, as well as excessive compared to the military advantage anticipated. Highly inappropriate rhetoric was reported by some Israeli representatives, but it was definitely not comparable to Al Bashir who issued clear and specific orders to damage the environment. The military operations have had an impact on majority of Gaza's territory and therefore it is reasonable to theoretically deal with the issue of criminal responsibility for some of the environmental damage. This might have a potentially positive outcome as it might induce the Israeli military officials as well as the representatives of the state to carefully consider all future operations, and thus prevent all the actions, that might already cause the crossing of the threshold stipulated by international criminal law.

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