



THE USE OF SATELLITE IMAGING TECHNOLOGY TO MONITOR VIOLATIONS OF THE LAWS OF WAR AND HUMAN RIGHTS IN AN ARMED CONFLICT

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Abstract

The Remote Sensing. Remote Sensing has also been considered very meritorious in exposing the barbarity of a violation of human rights values and a violation of the laws of war that occurs in an armed conflict. This can be seen in several cases of disclosure of damage on a massive scale to a number of areas destroyed by wars and human rights violence using satellite imagery. The emergence of alleged violations of war and human rights laws in an armed conflict based on satellite imagery references, seems to have given a new color in the mechanism for investigating and punishing perpetrators of war crimes and human rights. However, in reality, many of the various crimes confirmed from satellite imagery data are rarely published by a number of countries that have the technological capacity in the field of satellite imagery for various reasons. Therefore, it is necessary to take various steps of a comprehensive approach to force countries that have satellite technology to open satellite image data. There are a number of these steps; pragmatic approach steps by various international law enforcement agencies to improve the use of satellite imagery as part of the proof of international criminal behavior, internationalization steps by the countries of the world to make open efforts to make satellite imagery the first step of international investigations into war crimes and human rights crimes that occur in an armed conflict, The need for an independent international body that can verify the correctness of accurate satellite imagery data, and the legality of the operational mechanism of the UN General Assembly including the authority to investigate alleged violations of the laws of war based on satellite imagery data.

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I. INTRODUCTION

As part of international law, humanitarian law comprehensively regulates the procedures of war. The provisions on the manner of war are enshrined in the doctrines of classical humanitarian law in the form of *the principle of jus ad bellum*, or the law of war, which governs how a state is justified in the use of force of arms, and *jus in bello* which is the law of law applicable in war (*the conduct of war*) including its limitations and how the war should be conducted.

As a legal system that regulates the code of conduct regarding war, international humanitarian law is specifically designed to guarantee and maintain basic rights (such as the

right to life, security, health, etc.) for combatants in an armed conflict.[2] Universally, the emergence of a war is inseparable from the emergence of the decisions and political policies of a group of parties who want to fight for a right through their political units and military wings in the international system.[3]

Likewise, the provision that the parties involved in an armed conflict have the right to use unlimited weapons for the purposes and purposes of war. This restriction is based on two conditions. *First*, the provisions on general principles regarding weapons that have been developed. *Second*, the international community has accepted a number of specific prohibitions or any restrictions on which a particular form of weaponry or method of warfare has been agreed.[4]

These developments provide an understanding that the very close relationship between technological developments, especially military technology, and the application of human values that are the impact of military technology, go hand in hand. This can be seen from the emergence of a number of international conventions which are the impact of the development of military technology itself. Among these conventions, such as the Declaration of St. Petersburg of 1869, the Deng Hague Declaration I of 1899 on the prohibition of the use of stun gas, and the Deng Haag II Declaration on dum-dum bullets and the Deng Hague Convention IV of 1899 with its Annex on the regulation of the law and customs of war on land, are one of the proofs.[5]

The historical dynamics of the birth of a number of international conventions starting from the St. Petersburg Declaration[6] in the field of humanitarian law, which are the impact of technological advances and technological engineering, have given the impression of the reciprocal relationship between science, technology and war. Both regarding the weapon system that is increasing its capabilities and the support system, facilities and infrastructure. These developments clearly also affect the organization of the armed forces, the strategy and doctrine of the war itself.

One of the dynamics of these developments can be seen in the use of the space field as a new spectrum of military technology developments. As one of the military systems, space technology has been named the "4th dimension" of technological development in the millennium, and is a key factor in future warfare. The use of satellite technology both for

espionage or spy purposes and as a means of guiding missiles on land, sea and air is one of the proofs.[7]

The growth of satellite technology was initially triggered by the US-Soviet cold war. That was when the Soviet Union successfully launched its first satellite in 1957, named Sputnik. This Soviet success triggered the US military to develop similar satellite technology, so that in the 1960s the satellite industry grew in the country. The U.S. government established COMSAT, which operates as a private company to develop international satellites. Then in 1962, it cooperated with Europe. The United States successfully launched the "Telstar I" satellite, with its main mission of relaying television broadcasts over the Atlantic Ocean and Europe. This satellite makes an elliptical circle to the center of the earth. And in 1964, INTELSAT (International Telecommunications Satellite), a global organization with 199 countries, whose goal was to build and launch communications satellites, succeeded in giving rise for the first time to commercial communication satellites under the name "Early Bird".[8]

As a technology that was initially widely used for communication purposes, in its development the use of satellite technology metamorphosed into one of the most important military means in determining the direction of war. In addition to being one of the means of telecommunication, satellite technology has turned into the most important espionage tool and participates in the classic espionage system. One of these facilities is famous as *Remote Sensing*. Remote Sensing technology has changed the paradigm of visualizing our earth's surface from dream to reality, from science fiction to scientific evidence. Its technological leap has yielded very useful benefits for many fields related to the management of the use of the earth and its surface.

A very remarkable remote sensing technology product is in the form of satellite imagery with high spatial resolution, providing a highly detailed visual of the earth's surface. Satellite imagery is an image of the earth's surface recorded by sensors (cameras) on remote sensing satellites orbiting the earth, in the form of digital images. The use of satellite imagery today has a very wide range, especially in terms of related to the spatial space of the earth's surface, ranging from the fields of Natural Resources, Environment, Population, Transportation to the field of Defense (military).

Specifically in the military field, *applications of Remote Sensing* technology in the field of Hankam/Military include: Combat operations; Intelligence operations; Territorial activities; Operations of other military activities. With digital mapping technology for the depiction *of the Remote Sensing technology area, it has also been considered very meritorious in revealing the barbarity of a violation of human rights values and a violation of the laws of war that occurs in an armed conflict. This can be seen in several cases of disclosure of damage on a massive scale to a number of areas destroyed by wars and human rights violence using satellite imagery.*

The most dramatic example of this can be seen in a Human Rights Watch report identifying a total of 430 destroyed buildings in three villages of northern Maungdaw District. The data came from an analysis of high-resolution satellite imagery taken in the mornings of October 22, November 3 and November 10, 2016. According to the human rights group's report, during sectarian violence there have been unlawful killings of dozens of people by Myanmar Government forces and the Border Guard Police. Villages were burned and residents were shot at for no reason. Although the HRW report was denied by the Myanmar authorities, the source of the satellite data photo confirmed the fact that there were serious human rights violations against the Rohninya Muslim community.[9]

The same can also be seen how indications have occurred of violations of the laws of war carried out by the Islamic State group against the destruction of historical sites such as Palmyra and the Euphrates civilization of Iraq. A satellite image from April 4, 2015 shows the Bronze Age city of Mari on the Euphrates River in eastern Syria. Since it came under ISIS control, the site has been seen further exacerbated by the looting around the beginning of the second millennium BC palace of Zimri-Lim. A large number of very significant sites were destroyed by the war including Apamea, Dura Europos, Mari, Ebla. In the worst case we see thousands of looting pits covering the entire site, effectively destroying the remains of ancient cities. This type of large-scale looting appears to be most frequent in ISIS-held areas of eastern Syria.[10] And lastly, we can see how the destruction of Gaza over the past year has been due to Israeli attacks. Most of the region's largest buildings, hospitals, roads and refugee camps were destroyed.[11]

From the two cases above, it has been shown how effective and beneficial the use of satellite technology is in identifying violations of war and human rights laws that occur in an armed

conflict area. However, it is very unfortunate that until now there has not been a single record of the satellite imagery that can be used as evidence in the international court to punish the perpetrators of the violation of war and human rights laws.

A. Problem Identification

Based on the description above, what we want to identify from the research plan:

1. How can the provisions of humanitarian law make the use of remote sensing technology as evidence of violations of the laws of war and human rights in an armed conflict?
2. What steps can be taken by a number of parties to force a number of countries that have satellite sensing technology to publish satellite images of areas where violations of war and human rights laws are suspected to have occurred?

II. RESEARCH METHODS

The type of research that will be used in this study is descriptive and analytical, that is, trying to describe or describe analytically (provide a study).[12] Therefore, this analytical descriptive research is intended as a study to find facts with the right interpretation.[13]

The approach to this research problem is carried out by the normative juridical method mechanism which involves the study of literature through the study of literature materials or secondary data as well as legal comparison (*rechtscomparatief*),[14] which has the function of knowing and finding the provisions that regulate the legality of the payment of war compensation by Armenia to Azerbaijan in the Nagorno-Karabakh armed conflict, both those that contain the Conventions International, UN Resolutions, International Court of Justice Decisions, as well as Principles of International Law and national law. In addition, the comparison of these legal provisions is aimed at obtaining a comprehensive understanding of the two legal systems.

The legal materials used in this study include, Primary legal materials, namely legal materials that are binding in the form of norms or basic rules as in the Conventions on Humanitarian Law and Human Rights which explicitly regulate the payment of war compensation by the losing party to the winner of the war. Secondary legal materials are

materials that provide explanations of primary legal materials that can help analyze and understand primary legal materials, such as: books, research results, journals, writings of experts in the field of law both nationally and internationally related to humanitarian law, as well as various other reading materials related to this research. Tertiary legal materials, which are materials that provide instructions and explanations of primary legal materials and secondary legal materials, such as legal dictionaries, Black Law Dictionary, Indonesian dictionaries, and encyclopedias.

The data collection procedure in this study also uses Virtual Research (Virtually Research) carried out through information and communication technology (ICT) media, especially to obtain secondary data that is only obtained through internet sites.[15]

III. RESULTS OF RESEARCH AND DISCUSSION

1. Humanitarian Law Provisions Can Make the Use of Remote Sensing Technology as Evidence of Violations of War Law and Human Rights in an Armed Conflict

The development of international humanitarian law with the development of technology, especially military technology, related to the protection of war victims and human rights violations is greatly influenced by the development of human rights protection laws. As one of the latest technologies in the millennium, remote sensing technology has been used as one of the new bases for disclosure of violations of the laws of war and human rights in an armed conflict.

This development also further strengthened the determination of a number of international instruments related to the law of war and human rights, such as the Hague and Geneva conventions on the law of war, the Universal Declaration of Human Rights (DUHAM 1948), the European Convention on Human Rights (1950) and the International Covenant on Civil and Political Rights (1966). These conventions contribute to strengthening the view that all people have the right to enjoy human rights, whether in peace or in war.

The advent of satellite sensing technology has further narrowed the politics of denial by the parties involved in an armed conflict that there has been violations of the laws of war in the form of destruction and bombing of civilian residential areas and the alleged mass displacement of groups that should be protected in armed conflict. Which these actions constitute violations

of the Deng Haag Convention, as stated in Article 50 of the 1949 Deng Haag Convention which states:

The gross offences referred to in the preceding Article are offences which include the following acts, when committed against persons or property protected by the Convention: intentional murder, ill-treatment or inhuman treatment, including biological experiments, intentionally causing great suffering or serious injury to body or health, as well as extensive destruction and deprivation of property that is not justified by military interests and that is carried out unlawfully and arbitrarily.[1]

The provisions of Article 50 of the Convention clearly state the prohibitions that parties involved in an armed conflict should not pursue. But the reality is that all prohibitions of such actions are frequent and often denied to have been carried out by the parties involved in an armed conflict. The emergence of this denial is also understandable because it is sometimes one of the political strategies to prevent the emergence of foreign intervention for a number of violations that occur.

There is one special clause of Article 50 of the Deng Hague convention that is considered to be able to reveal the alleged violation of the laws of war by parties involved in an armed conflict using satellite sensing technology. The provision can be seen in the words "***extensive destruction and acts of confiscation of property that are not justified by military interests***". Satellite technology can really be relied upon as one of the first explorations to reveal the truth of possible violations of the provisions of the convention.

With its mapping capabilities, satellite technology can provide detailed image data of war-torn areas both before and after armed conflict. The existence of satellite technology can be considered as one of the new hopes in strengthening the capacity of international humanitarian law enforcement from the policy of denial by parties involved in an armed conflict. An example of this can be seen in the efforts to expose alleged human rights violations committed by the Myanmar Military Regime against the Rohingya ethnic group living in Myanmar's Rakhine state, despite the Myanmar military regime's denials.

As Human Rights Watch (HRW) reported on the damage in Myanmar's Rakhine state, the human rights group used the latest satellite imagery in October 2016 and found at least three villages on fire. HRW identified areas with building damage in the villages of Kyet Yoe Pyin, Pyaung Pyit and Wa Peik. All of them are located in the northern Maungdaw district of Rakhine State. The assessment used high-resolution satellite imagery recorded on October 22. Satellite imagery showed the presence of a large-scale fire in the village. HRW also monitors temperature anomaly data obtained by environmental satellite sensors. This report supports

previous reports of an alleged arson attack after 9 October 2016. The report is an initial assessment without being able to clearly know the total damage, losses and casualties.[2]

HRW also called on the UN to investigate the reported damage to the villages. The satellite imagery could eventually force Myanmar's military regime to accept a UN delegation to visit areas that are suspected to have suffered severe damage from the ethnic conflict. "The UN is called upon to investigate the deadly attack on October 9 and allegations that government forces committed murderous violence, sexual violence, arson and human rights violations against the Rohingya population in Maungdaw district, Rakhine," HRW said. Phil Robertson, deputy director of HRW Asia, said satellite imagery showed severe damage and needed an independent and separate investigation.

The Myanmar government, according to him, cannot do that. So far, he added, the government has continued to twist and block every aid institution. The government also continues to make excuses to keep an eye on international teams in the region. "The latest satellite imagery of the destruction of this village may be just the tip of the iceberg under the sea, little of what happened," Robertson said. He urged the Myanmar government to take responsibility for the justice of the perpetrators of the attacks in Rakhine, including several incidents that occurred on October 9, 2016.

2. What steps can be taken by a number of parties to force a number of countries that have satellite sensing technology to publish satellite images of areas where violations of war and human rights laws are suspected

The emergence of allegations of violations of war and human rights laws in an armed conflict based on satellite imagery references, seems to have given a new color to the mechanism for investigating and punishing perpetrators of serious international crimes, such as genocide, crimes against humanity and war crimes which are at the same time gross violations of human rights. And it is also hoped that in future developments, the emergence of satellite technology can increasingly encourage legal accountability for human rights violations, both in the categories of gross violations and crimes *against humanity* committed by parties to an armed conflict.

Provisions in various international humanitarian and human rights law instruments expressly state the obligation of the state to punish the perpetrators of crimes against the physical integrity

of a person. Official interpretations of international and regional bodies, as well as the opinions of leading experts on these instruments, repeatedly emphasize the importance of the judicial process and the punishment of perpetrators of gross human rights[3] violations. Such accountability is likely to increase at the stage where countries and individuals are held accountable.[4]

In its development, this accountability even includes the obligation to disclose the possibility of an act that is considered to have violated the principles of international humanitarian law and human rights through various existing international mechanisms. The United Nations through the United Nations General Assembly (UN) since 1978 and the International Law Commission since 1982 has paid attention to the issue of international criminal responsibility, to punish the perpetrators of war crimes and human rights through the drafting of a *Code of Offences against the Peace and Security of Mankind*. [5]

One of the manifestations of this accountability is the mobilization of war crimes and human rights through the mechanism of satellite imaging technology. As part of civilization, modern technological developments satellites have become a part of human life in different parts of the world. With satellites, people can connect with each other, regardless of distance and time, even in remote places. Satellites placed in geostationary orbit (GEO), which is with an altitude of 35,000 km, are generally used for television broadcasting needs. In addition, those placed closer to the earth, namely the Low Earth Orbit (LEO) satellite, which has an altitude of 400 km and tens of thousands of km, and the Mid-Earth Orbit satellite, which has an altitude of about 15,000 from the earth, are both used for the needs of personal communication services, such as mobile phones.[6]

In general, satellites can be divided into two types, namely natural satellites and artificial satellites. Natural satellites are of various sizes and revolve around primary celestial bodies. For example: the moon is a satellite of the earth, and the earth is a satellite of the sun. Man-made satellites are launched into orbit around a celestial body such as the earth or the moon. The use of artificial satellites is to:

- a. Communication between places on the earth's surface
- b. Become a reference point to determine a location in space
- c. Observing the earth and its environment
- d. Collect and report scientific information.

Specifically for the provisions of letter (c) in its development, the use of satellite technology is known as Remote Sensing technology. The advent of Remote Sensing has changed the paradigm of visualizing our earth's surface from dream to reality, from science fiction to scientific evidence. The leap in technology has produced very useful benefits for many fields, one of which is in the field of legal proof, to be known as one of the tools in uncovering criminal acts, such as the prosecution of war crimes and human rights that occur in an armed conflict.

As part of the development of technology, the presence of Remote Sensing technology has also been considered a contemporary forensic development for law enforcement in prosecuting an international crime such as war crimes and human rights. A very remarkable product of remote sensing technology is in the form of satellite imagery with high spatial resolution, providing a very detailed visual of the surface of the earth's territory, including monitoring the appearance of full-scale damage to the area that has been devastated by the total destruction caused by war, and it can be estimated that a war crime has indeed occurred over the region. Satellite imagery is a surface image of the entire area of the earth recorded by sensors (cameras) on remote sensing satellites orbiting the earth, in the form of digital images, and not all countries in the world have space technology capabilities.

Based on a report from the United Nations Office for Outer Space Affairs (UNOOSA) Report for 2022, there are more than 70 countries and two international organizations that have registered their space objects, which mostly consist of satellites, space probes, manned spacecraft, to space stations that have been launched from Earth. However, of these countries, only a handful of countries are considered to have the ability to have world satellite technology such as the United States, Russia, Indonesia, France, China, and India.[7] In addition to these countries, the development of sensing satellites is also owned by private parties such as Space X from the United States.[8] In its development, all satellite imagery data has also been accessible to all parties called Public Domain Satellite Imagery.

Not all satellite imagery is accessible for free. There are two types of satellite imaging services with different levels of accessibility, namely public domain and private domain;

1. Public Domain Satellite Imagery

A public domain satellite image type is a satellite image provided by an imaging satellite developer to be accessed for free by anyone who needs their satellite imagery product. The main function of public domain satellite imagery is to support scientific development

missions. Some real examples of satellite imagery companies that provide these products are Landsat, Corona, Sentinel, ASTER, and Meteosat.

2. Private Domain Satellite Imagery

Satellite imagery has undergone many transformations in its development over time, with satellite imagery evolving into a business product that can support operations and progress in a number of industries. This has encouraged the emergence of companies engaged in the satellite program development industry. Private domain satellite imagery is a type of satellite imagery that is not accessible to the public or sold exclusively. Geoeye, Spot Image, Airbus Intelligence, and China Siwei are some examples of industries that sell private domain satellite imagery products.[9]

The mastery of satellite technology by a number of countries with the capacity of satellite imagery technology can help the geographic information system (GIS) by producing geospatial data on various things including data on the destruction of territories due to war and predicting the possibility of war crimes and human rights in an armed conflict, it is appropriate for a number of countries that have this technology to confirm various potential possibilities of an armed conflict. war crimes and human rights in an armed conflict. The obligation to declare it is part of the international obligation to prevent and react to any event that undermines the value of universal humanity.

But in reality, many of the various crimes confirmed from satellite image crew data are rarely published by a number of countries that have the technological capacity in the field of satellite imagery. This is understandable because of the strong difference in interests between developed countries that own remote sensing technology and developing countries as well as interested parties in satellite sensing technology to uncover various war crimes and human rights in an armed conflict. Differences in the interests of countries encourage the creation of different perceptions of the law. Therefore, certain restrictive measures are needed that can be taken by a number of parties to force a number of countries that have satellite sensing technology to publish satellite images of areas where violations of war and human rights laws are suspected to have occurred. The number of these ranks;[10]

1. Pragmatic approach steps by various international law enforcement agencies to increase the use of satellite imagery as part of proving international criminal behavior

As part of space exploration activities, remote sensing satellite activities must be in accordance with the provisions of international law, especially space law. However, it turns

out that this international legal apparatus is still inadequate, and it can even be said that it is still vacuum in relation to remote sensing activities through satellites. In fact, remote sensing satellites are one of the applications of space technology that are very sensitive in terms of national sovereignty of countries, because of their trans-border nature. Regarding data and information of strategic value both from the aspect of criminal proof and as part of contemporary forensics, it is necessary to be used as the first pragmatic step to uncover various crimes that occur in an armed conflict.[11]

An example of this reel can be seen in the policy of the International Criminal Court (ICC). Prosecutors of the International Criminal Court ("ICC") and human rights groups rely on satellite imagery as evidence of international criminal behavior. This data is particularly helpful when investigating or prosecuting crimes within ICC jurisdiction, such as war crimes, genocide, and crimes against humanity. Satellite imagery can provide information about conflict zones that are difficult to collect on the ground. Furthermore, these crimes are often very difficult to prove, and satellite imagery can certainly make the work of investigators easier.[12]

While the benefits are numerous, satellite data collection also raises several concerns, First, there is a tension between human rights groups' reliance on satellite imagery and their advocacy regarding the human right to privacy. Second, there are problems with the reliability of satellite data, particularly in terms of accuracy and availability. Most of the satellite data was initially collected by private companies. Thus, private third parties, while not visible in most human rights reports or legal proceedings, can influence data that appears to be objective. The state also controls geospatial data companies, which further influences the way data is collected. In addition, obtaining satellite data may be costly for the ICC and human rights organizations.

2. Internationalization steps by world countries to make an open effort to make satellite imagery the first step of international investigations into war crimes and human rights that occur in an armed conflict.

The operation of remote sensing satellites has long been the subject of negotiations by UNCOPUOS (National Committee on the Peaceful Uses of Outer Space) which strives to create a set of international agreements. However, the strong stance of several countries, especially developing countries, that agreements on remote sensing using satellites in space should be able to guarantee the rights of the countries under it (subject states). These rights include the use of remote sensing results, and in their implementation the principle of state sovereignty must still be upheld and full of respect for one and the other. The ensuing disagreement between the western blocs that adheres to the so-called freedom of information and does not want it to be linked to the question of state sovereignty, while the eastern bloc countries and developing countries insist on the need to pay attention to the so-called

sovereignty aspect of a country. Also, information on natural resources cannot be freely disseminated without the permission of the sensed state.[13]

Developed countries argue that remote sensing activities do not violate the sovereignty principle. The reason for this is that although the sensing object is located within the national territory of another country, the place of sensing (*ratione locis*) is outside the sovereign territory of any country. Despite the conflict in the capacity of entitlement or not in the UNCOPUOS convention, the capacity of the offence is closely related to the crime of extra ordinary crimes or extraordinary crimes are actions committed by a person or group of persons or institutions to deprive another human being, as stipulated and approved in the UN Declaration of Human Rights and categorized as a gross and serious violation of Human Rights and The action is within the jurisdiction of the Rome Statute or the ICC and the International Criminal Court,[14] so it is appropriate for all countries to commit to open access to their satellite imagery data to prove whether or not war crimes and human rights have occurred in an armed conflict.

Ketentuan yang mendasari munculnya tanggung jawab negara pada kejahatan extra ordinary crimes ini pada hakikatnya adalah pelanggaran terhadap hak subjektif negara lain, pelanggaran terhadap norma hukum internasional yang merupakan *jus cogens* dan tindakan-tindakan yang berkualifikasi sebagai kejahatan internasional seperti kejahatan perang dan HAM. Penjelasan hal tersebut sebagaimana pernyataan Karl Zemanek menjelaskan, bahwa : "In accordance with the relativity of international rights and duties, which is one of the characteristics of international law as a decentralized system, responsibility of States arises in response to the violation of a subjective international right of another State. However, with the United Nations Charter and with the recognition of peremptory norms of international law (*jus cogens*) in the Vienna Convention on the Law of Treaties, obligations owed to the international community as a whole began to emerge. From among them ILC has tried to single out some, like the prohibiting aggression, slavery, genocide, apartheid, the maintenance by force of colonial domination (Colonies and Colonial Regime) or the massive pollution of the atmosphere or the seas, whose violation would qualify as an international crime, giving all States the right to react..."[15]

Further developments, international law further strengthens the importance of the responsibility of the country that owns satellite imagery technology for the emergence of a number of violations of war and human rights laws, both in the categories of gross violations and crimes against humanity. Various international humanitarian and human rights law instruments expressly list the obligation of the state to work together, including providing related data, in this case can be interpreted satellite imagery data on war crimes in an armed conflict, in order to punish the perpetrators of war crimes and human rights against a person's physical integrity. Official interpretations of international and regional bodies, as well as the opinions of leading experts on these instruments, have repeatedly emphasized the importance of the judicial process and the sentencing process through related evidence, such

as satellite imagery, against perpetrators of gross human rights violations committed in an armed conflict.

3. The need for an independent international body that can verify the correctness of accurate satellite imagery data.

Satellite monitoring technology "is used in human rights work to uncover and interpret, then incorporated into digital platforms to establish and supplement evidence through expert testimony in trials." Although human rights groups criticize the surveillance practices of geospatial data companies, they often rely on publicly available data from such companies when investigating human rights abuses. They also buy imagery from private companies that collect geospatial data. These organizations' concerns about the human right to privacy clash with their use of satellite data in human rights reporting. When human rights groups buy geospatial data from private companies, they are financially supporting organizations that may be violating privacy rights on a pervasive scale. Hence the need for an independent international body that can verify the correctness of accurate satellite imagery data.

This is reasoned because satellite imagery technology also raises questions about its reliability. Certain data may be obfuscated on publicly accessible platforms. This practice, historically called cartography censorship, has been going on for centuries but is "still widely practiced," and is "justified on the grounds of national security, political expediency, or commercial necessity." [35] Modern forms of cartography censorship are most commonly used to serve military purposes. This censorship may be required by law, as in the case of the Kyl-Bingaman Amendment, which restricts the resolution of satellite imagery taken from Israel by private entities in the US. States are also making open efforts to influence satellite imagery, including through litigation against geospatial data companies for failing to obscure images of sensitive military sites. Furthermore, states have put pressure on geospatial imaging companies through public criticism when satellite data has revealed sensitive military information. Private agreements may also exist between governments and geospatial data companies to obscure or censor sensitive data. [39] Thus, reliance on satellite imagery has the potential to distort human rights investigations, as this can force investigators to rely on incomplete information. It would be very difficult for human rights groups to rely on publicly available satellite imagery to show, for example, war crimes committed near military bases, given that those locations and the surrounding areas are often obscured by geospatial data companies.

It is unclear how accurate the geospatial data from private companies is. There is no independent body that verifies that the company provides accurate data. Compounding the difficulties described above, the top ten geospatial data companies are all located in the United States, or in countries closely allied with the United States (Canada, the United Kingdom, and France). These companies may also have made "national security"

agreements with their respective governments. So, even if the image itself is accurate, certain important data may have been omitted.

4. The legality of the UN General Assembly's operational mechanism includes the authority to investigate alleged violations of the laws of war based on satellite imagery data.

The legality of the operational mechanism of the United Nations includes the authority to investigate alleged violations of the laws of war, so that these events can strengthen the international will to propose the idea of establishing a tribunal that can include all the perpetrators.[16] One of these allegations includes the detection through the use of satellite imagery of a number of humanitarian disasters that arise in an armed conflict. The provisions of the United Nations as one of the world's major organizations that have the power and responsibility required to take certain actions for violations of the principles of war law and human rights. One of them is to prevent the further escalation of armed conflict as a mandate as stipulated in its charter. These provisions can be seen in the provisions of articles 41 and 42 of the UN Charter which state:[17]

Article 41:

The Security Council may decide what measures not involving the use of armed force are to be employed to give effect to its decisions, and it may call upon the Members of the United Nations to apply such measures. These may include complete or partial interruption of economic relations and of rail, sea, air, postal, telegraphic, radio, and other means of communication, and the severance of diplomatic relations.

Article 42:

“Should the Security Council consider that measures provided for in Article 41 would be inadequate or have proved to be inadequate, it may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security. Such action may include demonstrations, blockade, and other operations by air, sea, or land forces of Members of the United Nations.

The two Articles of the UN Charter give the impression that the role and function carried out by the UN is to take collective action against efforts to prevent armed conflict and the escalation of atrocities for any violation of the norms of the law of war itself. One of the very unique things about how the UN issued its Resolution is precisely based on the allegation of violations of the laws of war through satellite imagery. Such collective action, including decision-making efforts to prevent the escalation of armed conflict through preventive measures and minimize the impact of such armed conflicts, can be seen in UN General Assembly Resolution No. A/60/I of October 24, 2005, in particular Paragraph 139 which states:

The international community, through the United Nations, also has the responsibility to use appropriate diplomatic, humanitarian and other peaceful means, in accordance with Chapters VI and VIII of the Charter, to help to protect populations from genocide, war crimes, ethnic cleansing and crimes against humanity. In this context, we are prepared to take collective action, in a timely and decisive manner, through the Security Council, in accordance with the Charter, including Chapter VII, on a case-by-case basis and in cooperation with relevant regional organizations as appropriate, should peaceful means be inadequate and national authorities are manifestly failing to protect their populations from genocide, war crimes, ethnic cleansing and crimes against humanity. We stress the need for the General Assembly to continue consideration of the responsibility to protect populations from genocide, war crimes, ethnic cleansing and crimes against humanity and its implications, bearing in mind the principles of the Charter and international law. We also intend to commit ourselves, as necessary and appropriate, to helping States build capacity to protect their populations from genocide, war crimes, ethnic cleansing and crimes against humanity and to assisting those which are under stress before crises and conflicts break out.[18]

Legally positive, law enforcement at the level of international law on efforts to make satellite imagery part of the proof of criminal acts that occurred in an armed conflict, has been considered as a source of strong scientific evidence that is useful in uncovering the occurrence of war crimes and human rights in an armed conflict. Its relevance to the global order, photographs from satellite imagery of a region devastated by armed conflict and the alleged possibility of a war and human rights crime, have been recognized as part of forensic evidence. Photos from satellite imagery have also been recognized as evidence in court and have been promulgated into law in several European countries, as well as supra-national international law enforcement agencies such as the ICC.

IV. CONCLUSION

The advent of satellite sensing technology has further narrowed the politics of denial by the parties involved in an armed conflict that there has been violations of the laws of war in the form of destruction and bombing of civilian residential areas and the alleged mass displacement of groups that should be protected in armed conflict. There is a special passage of Article 50 of the 1949 Deng Hague Convention which is considered to be able to reveal the alleged violation of the laws of war by the parties involved in an armed conflict using satellite sensing technology. The provision can be seen in the words "extensive destruction and acts of confiscation of property that are not justified by military interests". Satellite technology can really be relied upon as one of the first explorations to reveal the truth of possible violations of the provisions of the convention.

Certain restrictive measures can be taken by a number of parties to force a number of countries that have satellite sensing technology to publish satellite images of areas where violations of war and human rights laws are suspected to have occurred. The number of these ranks; (1). Pragmatic approach steps by various international law enforcement agencies to increase the use of satellite imagery as part of proving international criminal behavior; (2). Internationalization steps by world countries to make open efforts to make satellite imagery the first step of international investigations into war crimes and human rights crimes that occur in an armed conflict. (3). The need for an independent international body that can verify the correctness of accurate satellite imagery data. (4) The legality of the operational mechanism of the UN General Assembly including the authority to investigate alleged violations of the laws of war based on satellite imagery data.

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