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Research Report

Disarmament & International Security Committee

The Question of the use of Sonic Weapons in Warfare

Background

Using sound as a tool to psychologically and/or physically harm individuals has been a common strategy in warfare. The terms given to this tactical usage of sounds to disrupt enemy behaviour or physical state are sonic or acoustic weapons. It is important to note that there are various forms in which they can come in - ranging from playing loud music at front lines during the night in order to provoke sleep deprivation to producing noises that have an intensity of up to around 160 decibels, which has the potential of inflicting permanent hearing damage, dizziness and disorientation.

There are mainly three categories under which each sound weapon can fall under - low frequency, high frequency and within the audible range. Firstly, low frequency weapons consist of waves that are under the human hearing threshold; these waves are described as “infra waves” and can cause internal organs or structures to vibrate, causing discomfort, nausea and potential internal tissue damage. An example weapon of this category includes the vortex ring gun. Secondly, high frequency arms, such as the ‘Medusa’ (Mob Excess Deterrent Using Silent Audio) are sounds above the human hearing capacity and the waves are called ultrasound waves. Their frequencies usually range around 20,000 Hz and can cause tissue damage and pain. They can have vigorous effects when the waves are concentrated into a small beam. Lastly, there are weapons that are within the audible range, which are commonly used to inflict hearing damage and emotional distress, if exposed to it over a certain period of time. The most prominent and developed sonic weapon falls under this category; the Long Range Acoustic Device (LRAD) is a highly directed sound tool invented by the U.S. in 2000.

The Long Range Acoustic Device can direct noise in a concentrated beam to around 5,000 metres and its intensity is of 162 dB (at one metre). Its primary purpose is to communicate information over long distances but it can also be used to control crowds and inflict non-lethal damage. The U.S. is especially known to be a user of this acoustic arm; the state demonstrated its harmful effects in 2004 in the Iraq war.

Currently more than 20 countries have adopted its usage and deployed it in various different situations. A more recent example includes the Israeli military that used the LRAD in Gaza to break up protests by creating a distressing environment for demonstrators. The Long Range Acoustic Device is not the only weapon that can achieve this effect, there are numerous other devices and arms similar to it. For example, despite not being as strong as the LRAD, China has developed portable sonic weapons that if developed further, could be innovative in warfare.

Moreover, playing loud music (in most cases being rock music) as a way of boosting the troops personal morale and threatening the enemy, has also played a significant role in warfare. For example, during the U.S. invasion of Panama in 1989, U.S. troops played heavy metal songs to cause Panama’s leader to surrender, after having closed himself off in the Vatican’s Panama City

embassy. This demonstrates how loud noises can be advantageous in changing the course of war in favour of a country without inflicting long-lasting physical injuries by using conventional firearms. Because of the several benefits of these acoustic weapons in defence and attack, these arms have gained many users, such as the United States, the People's Republic of China and Israel.

Sonic weapons have provided an alternative pathway in conducting war, as it allows for psychological distress and pressuring of armed forces. This could be considered as a fundamental advantage over conventional arms since these weapons won't inflict lethal wounds and hence, reduces the number of casualties in warfare. Additionally, the sound waves will not destroy important infrastructures and monuments, like religious sites.

Due to their capacity to affect the human mental state, it has been classified as a tool for psychological warfare. Some effects of loud noises and music as acoustic weapons include fear, confusion and extreme emotional distress that can have long-lasting mental effects. Research suggests that high intensity sounds can also induce nausea and breathing difficulties which on numerous occasions have not only affected soldiers of a country's military but also by-standers and civilians, due to the lack of control over the direction of the sound. Hence, sonic weapons in warfare have raised numerous ethical questions; various states have expressed their interest in regulating their usage. Whilst some official documents suggest that the usage should be limited, only vague guidelines exist.

Overview of Current Issues

Disputes on the Usage of Sonic Weapons

Even though sound has been used throughout history as a way of threatening the enemy, advancing technology has just recently given rise to the continuously evolving acoustic devices such as the LRADs. The lack of research into the relatively new armament have created a gap of understanding and knowledge about the potential of the various sorts of sonic weapons. This also sparked debate about whether it is justifiable to use in warfare.

On the one hand, sonic weapons prove to be an effective non-lethal way of weakening the enemy and causing them to surrender without causing physical harm, unlike firing arms. It can also be used as a means to communicate effectively with allies and opponents to prevent fatal measures being taken.

On the other hand, there are certain acoustic devices which can in fact cause permanent damage and provoke symptoms such as migraines and confusion. Moreover, the potential inability to successfully direct the weapon has demonstrated how civilians can come under harm when the

weapon is used without enough care. The emotionally distressing surrounding which is created by the sonic weapons has the potential of causing anxiety and other stress disorders.
Hence, sound weapons have been a source of ethical concerns and call for numerous human rights considerations.

Lack of Legal Framework for Sonic Weapons

Whilst restrictions for such armaments in general are in place, regulations specifically for sonic weapons have remained sparse. This could pose an issue, as the sonic technology is unlike many other weapons commonly used in warfare. The lack of research and the ambiguous understanding of these types of weapons make it difficult to create effective regulations.

For example, the U.N. Charter doesn't explicitly cover the use of sonic weapons and only implies how it could fall under the illegitimate use of force.

Furthermore, Article 35 of Protocol I to the Geneva Conventions states that "the use of weapons of such a nature as to cause superfluous injury or unnecessary suffering is prohibited". However, this only creates an ambiguous connection to sonic weapons and is therefore often overlooked.

Relevant Countries and Organisations

United States of America

As described earlier, the U.S. is one of the most frequent users of these types of weapons. Having invented the LRADs and supplied it to the majority of U.S. navy units. Moreover, their military forces have already made use of sonic weapons in Iraq in 2003-2004, as well as in 2008 during anti-piracy operations in Somalia.

China

China has increasingly invested into the development and production of sonic weapons, which mirrors its interest in the deployment of these sorts of arms in crowd and border control. One recorded event in which China made use of sonic weapons was in 2020, when there was tension between Indian and Chinese forces along the border in the Himalayas. They made use of low-frequency weapons instead of conventional arms.

Canada

Canada has been the country that arguably expressed its concerns strongest regarding the ethics of these weapons. After a LRAD was used for crowd control at the G20 Summit in Toronto, critics

suggested that these weapons pose an unnecessary health and safety risk to civilians. Hence a Canadian court ruled to limit the usage of this sonic weapon in crowd control.

European Union

The EU has voiced its concerns on the usage of sonic weapons, especially in crowd control and in scenarios of warfare in which non-combatants could come to harm. The Union has been actively highlighting the necessity to minimise the harm inflicted on civilians and suggested that sonic weapons could pose a threat to humanitarian law if not used cautiously.

Possible Solutions

Restriction of certain types of Sonic Weapons

One possible way of solving the question of sonic weapons in warfare is by classifying them into different categories. These classes could be based on the strength and capacity to inflict long-term harm of each arm. Sonic weapons with the highest likelihood of posing great threats towards non-combatants could then be banned or heavily restricted.

Research into Sonic Weapons

Another way of solving this question is by funding the research of acoustic weapons. This could increase the amount of knowledge about health effects and other risks associated with these weapons. Moreover, it could give a better understanding of how to deal with sonic arms.

Strengthening the Oversight of International Organisations

By empowering the UN or other international organisations such as the International Committee of the Red Cross, transparency over the use of such weapons could be enhanced. This could promote the knowledge of when and where these weapons were used and make sure that its operation lines up with the ethical usage of these sound weapons.

Improved Training

Improving the training of soldiers using such weapons could decrease the likelihood of them being misused and ensures that soldiers and civilians aren't unnecessarily exposed to the sound for an extended period of time. Furthermore, operators would understand the risks linked to the arms and know how to handle the weapons more carefully. This way they would know in which scenarios the usage of the sonic weapons would be appropriate and least harmful.

Relevant Websites and Articles

Acoustic Weapons (Article36)

This article gives a clear idea of what sonic weapons are, the problems associated with them and demonstrates the most popular arguments that are being made when defending or opposing these devices. It distinctly highlights the various different types of acoustic weapons and mentions the legal documents that have been put in place by the IHL and IHRL that restrict using sound as a weapon.
https://article36.org/wp-content/uploads/2020/12/acoustic-weapons.pdf

Acoustic weapons, a new military technological capability? (Atalayar)

This article briefly mentions the views of Spain on the matter of sonic weapons. However, it clearly emphasises the key risks and disadvantages of acoustic weapons and demonstrates how the Geneva Convention suggests the possibility of these weapons becoming a human rights threat. Nevertheless, the article also states that the increasing interest in such sound arms reflects the advancement of military technology and how international organisations should work together to develop new defence strategies.
https://www.atalayar.com/en/opinion/edgar-jimenez/acoustic-weapons-new-military-technological-capability/20210409133532135297.html

Sonic Warfare: Noise as a Weapon (hearinghealthmatters.org)

In this article you will find all the relevant information about how sonic weapons operate and how specific sound intensities lead to certain health issues. Moreover, it goes into detail about the numerous usages of the LRADs.
https://hearinghealthmatters.org/hearing-international/2023/sonic-warfare-noise-as-a-weapon/

Sonic Weapons' Long, Noisy History (history.com)

Past events and the development of sonic weapons are clearly explained in this article. It also once again highlights the different scenarios in which these acoustic arms have been proven to be beneficial. It also touches on the events in Cuba in 2017.
https://www.history.com/news/sonic-weapons-warfare-acoustic

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