

Forum: Special Conference (SPC)

Question of: Implementing measures to ensure the safe disposal of explosive remnants of war

Student Officer: Ianna Choi, Assistant President

Introduction

Explosive Remnants of War (ERW) are explosive devices left behind after conflicts that pose great dangers to the well-being of citizens, a nation's economy, environment, and infrastructure.¹ War or military conflict is the initial cause of ERW; long-term and short-term conflicts can result in major explosive weaponry problems. For example, after the armed conflict in mid-2006 (34 days), Lebanon became littered with ERW. According to the United Nations Mine Action Coordination Center in South Lebanon, over 35 million square meters of the nation's land are contaminated with these weapons. Two hundred civilians were killed or injured after the war, and thousands of others were denied access to their land.² Abandoned explosive ordnance and failure to indicate and remove these weapons are the primary concern present for the problem.

Nations abstaining from signing and ratifying conventions or treaties protecting citizens from these explosive weapons like the Convention on Certain Conventional Weapons (CCW) and the Geneva Convention are also contributing factors that worsen the issue. Having these weapons present in nations prolong the effects of war even after conflicts have died down and the involved nations have agreed upon peace. Moreover, due to the several dangers and lack of strategy and information available regarding the safe disposal of ERW, many impacted countries have avoided taking action, causing harm in the long term. Additionally, many nations contaminated with ERW or in conflict areas fail to provide their citizens with effective mine risk education (MRE). Consequently, citizens, predominantly children with direct contact with these weapons, are unaware that these devices are lethal and unstable, and if touched or disturbed, detonation may happen.³ ERW is particularly a problem for children: while deaths are the most

¹ "Mines and Explosive Remnants of War." UNHCR. <https://www.unhcr.org/4794b3da2.pdf>.

² "Lebanon Landmine Impact Survey." Global Landmine Survey. <https://www.gichd.org/fileadmin/pdf/LIMA/Report-Landmine-impact-survey-Lebanon.pdf>.

³ "<http://www.the-monitor.org/en-gb/the-issues/erw.aspx>." Landmine and Cluster Munition Monitor. <http://www.the-monitor.org/en-gb/the-issues/erw.aspx>.

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protruding issue, loss of parents, physical space, access to education, and cultivable land are all problems imposed onto these children due to the presence of ERW.⁴

Clearing and demining ERW often takes several years or even decades; it requires many resources, physical labor, and aid from professionals and nongovernmental organizations (NGOs). Unfortunately, some low and middle-income countries (LMICs) find it difficult to access technical equipment even with financial aid from more economically developed countries (MEDCs). In receiving support, LMICs will face the burden of being indebted to such countries. Additionally, during these years of clearance, many citizens and workers are susceptible to significant injury and death in case of contact. Many other issues arise surrounding ERW, including the hindrance of reconstruction, the difficulty for refugees to return, and the delivery of humanitarian assistance.⁵

Landmines were one of the first and most significant ERWs used in the past, the weapon being traced back to the American Civil War, used explicitly as defensive mechanisms during World War 1. Considering the size of anti-tank mines, enemy troops could enter minefields and detach mines for their use. Therefore, anti-personnel (AP) mines were sown throughout anti-tank minefields to deter opposing armies and to channel enemy forces into possible ambush situations.⁶ When landmines were first introduced, they were solely used as defensive weapons to protect the anti-tank mines. However, their proliferation for offensive purposes advanced during WW2 and the Afghan-Soviet war. Technological advancements such as air scatterer munitions enabled rapid land contamination with AP mines.

International humanitarian law and mine action has evolved drastically since 1974 when the Swedish government first convened a conference of governmental experts called the Weapons that May Cause Unnecessary Suffering or Have Indiscriminate Effects. Later in the 1990s, The Anti-Personnel Mine Ban Convention (APMBC), a framework for international mine action, had successfully agreed with 164 states.⁷ The first major treaties or conferences on ERW centered around landmines; this was mainly because mines were the first widespread ERW used in large-scale conflicts like World War 2. Weapon technology and knowledge were not as developed compared to modern times, therefore, land mines were

⁴ Watts, Hugh G. "The consequences for children of explosive remnants of war: Land mines, unexploded ordnance, improvised explosive devices, and cluster bombs." National Library of Medicine. <https://pubmed.ncbi.nlm.nih.gov/21791815/>.

⁵ "CLEARING LANDMINES AND EXPLOSIVES." The HALO Trust. <https://www.halotrust.org/what-we-do/our-work/clearing-landmines-explosives/>.

⁶ "Together for mine action; a multilateral success story." UNMAS. <https://www.unmas.org/sites/default/files/History-of-mine-action/>.

⁷ "Together for mine action; a multilateral success story."

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the first type of ERW to be considered a threat to citizens by the international society. However, the 21st century continued with more elaborate and established treaties and conventions that targeted ERWs; the Convention on Certain Conventional Weapons and the Convention on Cluster Munition were two major examples of these actions. Despite the vast efforts to limit the effects of ERW, it is ultimately difficult to prevent and exacerbate its impact amidst ongoing conflicts.

Luckily, several organizations have stepped up to dedicate their time and resources to clearing ERW, a major one being the HALO Trust, a humanitarian NGO making lands safe for nations that have previously been under conflict. The HALO Trust has been working with several LMICs expanding its scope and breadth from Afghanistan to several countries in Africa, Europe, South Asia, the Middle East, and Latin America.⁸ The organization volunteers groups of women and men to transform futures and help families get back on their feet. The United Nations Mine Action Service (UNMAS) has similarly committed to coordinating and implementing activities to eliminate the threat posed by mines and ERW. UNMAS has aided affected communities by demining schools, allocating funds for necessary countries, and introducing a training program for volunteers among Afghan refugees. UNMAS previously cooperated with the International Committee of the Red Cross (ICRC) to add detailed accounts and testimonies on the landmine crisis in medical reports.⁹

Adding to this, UNMAS has used the evolution of technology as a key to advancing its techniques, for example, training and utilizing mine-detecting dogs to sniff out hidden mines and prevent accidents. As a development from the 1990s, mine detectors, a "Mine Eye," was developed. The "Mine Eye" uses an electromagnetic radar to visualize the shape and the depth of mines buried underground.¹⁰ In addition, countries like Iraq have furthered ERW identification through technology like drones; various explosive devices were hidden in open fields, and trainees were required to locate and photograph them using drones. The drone technology effectively allows deminers and surveyors to analyze and evaluate ERW before attempting to demine them. Organizations like The Halo Trust and UNMAS collaborate to make the mine-free world a reality.

Definition of Key Terms

⁸ "CLEARING LANDMINES AND EXPLOSIVES." The HALO Trust.
<https://www.halotrust.org/what-we-do/our-work/clearing-landmines-explosives/>.

⁹ "Annual Report 2019." UNMAS. Last modified 2019.
https://www.unmas.org/sites/default/files/unmas-2019ar_web.pdf.

¹⁰ "Annual Report 2019." UNMAS.

Explosive Remnants of War (ERW)

Explosive Remnants of War (ERW) are explosive devices or weapons left behind after a conflict. Examples include unexploded grenades, rockets, bombs, cluster munitions, artillery shells, grenades, missiles, and mortars.¹¹ ERW consists of:

1. Unexploded ordnances (UXO) - weapons or ammunition fired but failed to employ, posing a risk of detonation. UXO with large explosive payloads are highly dangerous because of the blast or fragmentation kill radius they are capable of creating. If disturbed, such explosions cause severe injuries to individuals and potentially cause death.¹²
2. Abandoned explosive ordnance (AXO) - explosives that were not used during an armed conflict, left behind, and no longer under the control of a party.¹³ It is hard to determine if AXOs are primed, fuzed, armed, or prepared for use, making them a hassle to dispose of and hazardous if mishandled.

Conflict zones

Conflict zones refer to a zone in which belligerents are waging war; this is usually caused by political instability that disrupts services like housing, transportation, communication, sanitation, medical and more.¹⁴ Citizens living in conflict zones will often be displaced from their homes, consequently causing them to be exposed to toxic chemicals, radioactive explosives, and munitions. Most ERW are found within these conflict zones after the conclusion of a war.

Mine action

Mine action, run under the United Nations Mine Action Service (UNMAS), identifies and reduces the impact of the risk of explosives. Mine action entails more than removing such explosives from grounds but aims to protect individuals in danger and aid ERW victims.¹⁵ There are five significant pillars of mine action:

1. Clearance - surveys, mapping, minefield marking, and mine clearance. Clearance covers both military and humanitarian. Military mine clearance focuses on clearing a safe path so soldiers can

¹¹ "Explosive Remnants of War." Landmine and Cluster Mmunition Monitor. Last modified March 2019.

<http://www.the-monitor.org/en-gb/the-issues/erw.aspx>.

¹² "Leftover Unexploded Ordnance (UXO)." Legacies of War.

<https://legaciesofwar.org/about-laos/leftover-unexploded-ordnances-uxo/>.

¹³ "Leftover Unexploded Ordnance (UXO)." Legacies of War.

¹⁴ "Conflict Zones Update." SKYbrary.

<https://skybrary.aero/articles/conflict-zones-update#:~:text=Conflict%20Zones%20%E2%80%94%20Airspace%20over%20areas,which%20might%20endanger%20civil%20aircraft>.

¹⁵ "Mine Action." United Nations Peacekeeping. <https://peacekeeping.un.org/en/mine-action->.

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advance during the conflict. Humanitarian mine clearance aims to clear land so civilians can safely return home without the threats of ERW.

2. Mine risk education (MRE) - educational activities focused on reducing the risk of injuries from ERW through raising awareness and promoting behavioral change through information campaigns, training, and liaison with communities. Victim assistance - providing aid and care, rehabilitation, social and economic integration of mine victims, and mine awareness programs. The aid includes emergency and medical care, physical rehabilitation, psychosocial support, and social inclusion. Victim assistance also sheds light on laws and policies supporting efficient treatment, protection, and aid for all disabled individuals.
3. Advocacy - encouraging universal participation in existing international agreements, treaties, or conventions that ban or limit the use of landmines or explosives. The United Nations provides technical support and advice to state meetings to increase the efficiency of implementing viable solutions and instruments.
4. Stockpile destruction - technical support to aid the destruction of stockpile explosive hazards under Article 4 of the Mine Ban Convention, which states that State Parties must destroy stockpiled mines within four years of accession to the Convention. UNMAS assists in the proper storage and inspection of these devices.¹⁶

Mine casualty

Mine casualty, synonymous with 'direct victim,' is caused when an accident or disturbance occurs with an active mine, ERW, UXO, or AXO, which denotes a person, causing them to either be injured or killed. People injured by mine or ERW need immediate and intensive medical assistance.¹⁷ Even if they survive, victims require prolonged physical rehabilitation, can suffer permanent injury or disability, and face severe social, psychological, and economic burdens.

International Humanitarian Law (IHL)

The International Humanitarian Law, also known as the laws of armed conflict, is a set of regulations that aim to, for humanitarian reasons, limit the effects of armed conflicts. The IHL distinctly applies to armed conflicts, excluding internal tensions or disturbances like isolated acts of violence.¹⁸

¹⁶ "5 Pillars of Mine Action." UNMAS. <https://www.unmas.org/en/5-pillars-of-mine-action->

¹⁷ "Victim assistance in the context of mines and explosive remnants of war." Handicap-International. Last modified July 2014. https://handicap-international.ch/sites/ch/files/documents/files/assistance-victimes-mines-reg_anglais.pdf.

¹⁸ "What is International Humanitarian Law?" ICRC. Last modified July 2004. https://www.icrc.org/en/doc/assets/files/other/what_is_ihl.pdf.

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A central notion of the IHL is the principle of distinction: certain people and objects enjoy protection against attacks because of their civilian status.¹⁹ The principle of distinction ensures that attacks are only on the armed forces of a party to the conflict, creating a safety barrier for civilians against missiles, explosives, and any weapons. It prohibits indiscriminate attacks that strike illegitimate parties or targets (civilians) without distinction.²⁰

Cluster munitions

A cluster munition is an air-dropped explosive weapon with an inner contained ejecting smaller submunitions.²¹ Depending on the model, the number of submunitions released can vary from several dozen to more than 600. Cluster munitions have been a persistent problem for decades; the large-scale effects of these weapons and the large numbers of submunitions that fail to explode as intended constitute a significant cause of civilian casualties. Credible estimates of the failure rates of these weapons range from 10% to 40%, posing severe dangers to individuals in contaminated areas.²² The presence of such explosives displaced civilians from their homes/countries obstructs relief and reconstruction efforts, and makes vital subsistence activities like farming hazardous for years.

The United Nations Convention on Certain Conventional Weapons (CCW)

The CCW is a convention banning and restricting the use of certain weapons considered to cause unjustifiable suffering to affected civilians.²³ Although there are five protocols in the CCW, protocol V on Explosive Remnants of War is most significant to the agenda. There are five specific provisions to the protocol:

- 1) Parties that become participants in an armed conflict bear responsibility concerning explosive remnants of war in territory under their control
- 2) After the cessation of active conflict, as soon as feasible, such a Party to an armed conflict shall mark, clear, remove, or destroy explosive remnants of war in affected territories under its control.

¹⁹ "The principle of distinction." IHL.

<https://www.diakonia.se/ihl/resources/international-humanitarian-law/principle-of-distinction-protection-of-people-and-objects/>.

²⁰ "Practice Relating to Rule 12. Definition of Indiscriminate Attacks." ICRC.

https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_cou_ca_rule12#:~:text=Indiscriminate%20attacks%20are%20those%20that,They%20are%20prohibited.

²¹ "Cluster munitions: what are they and what is the problem?" ICRC. Last modified January 8, 2010.

<https://www.icrc.org/en/doc/resources/documents/legal-fact-sheet/cluster-munitions-factsheet-230710.htm>.

²² "Cluster munitions: what are they and what is the problem?" ICRC.

²³ "The Convention on Certain Conventional Weapons." United Nations Office for Disarmament Affairs.

<https://www.un.org/disarmament/the-convention-on-certain-conventional-weapons/>.

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- 3) Parties shall, to the maximum extent possible, record and retain information on the use of explosive remnants of war and make available such information to the party in control of the affected areas.
- 4) Parties shall take all feasible precautions to protect the civilian population from the risks and effects of explosive remnants of war.
- 5) Parties shall cooperate among themselves and with other States and organizations and assist each other in fulfilling their duty of clearance, removal, or destruction of explosive remnants of war.²⁴

Timeline of Key Events

January 30, 1933 - May 8, 1945 - 'Bouncing Betty'

During the Third Reich, the Nazi regime, German engineers discovered an antipersonnel mine nicknamed the 'Bouncing Betty', also known as the German S-mine. The mine was considered one of the deadliest battlefield tools, extending into WW2. The 'Bouncing Bettys' were buried underground with three prongs sticking out, camouflaged by nearby vegetation. If these prongs were disrupted, the mine would rocket 3 feet upwards (around the victim's waist) and shoot 360 steel balls, acting as harmful explosives. The landmine had great psychological effects on affected troops as it did not kill but inflicted wounds.²⁵ Although there were metal detectors then, they were heavy and expensive, making them unavailable for the infantry units. Allies used knives and bayonets to examine soils and disarmed landmines using a sewing needle. The 'Bouncing Betty' stopped production after World War 2. It was believed that the remaining mines were destroyed after Germany's surrender; however, some mines may have been kept for analysis by the allies.²⁶ There was also a claim that the Bouncing Betty had a life span of two to seven years; despite this, there is a fear that undiscovered and undestroyed mines could still have the ability to be activated now. For example, previous Warsaw Pact countries, North Africa, France, and Germany, occasionally fall victim to the activation of unfound S mines, proving that such dated explosives may remain.²⁷

²⁴ "Protocol on Explosive Remnants of War (Protocol V to the 1980 CCW Convention), 28 November 2003." ICRC. <https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/INTRO/610#:~:text=The%20Protocol%20on%20Explosive%20Remnants,end%20of%20an%20armed%20conflict>.

²⁵ Kirkpatrick, Tim. "This is why the 'Bouncing Betty' was absolutely devastating." We Are The Mighty. Last modified September 22, 2021. <https://www.wearethemighty.com/mighty-history/this-is-why-the-bouncing-betty-was-absolutely-devastating/#:~:text=Dubbed%20the%20%E2%80%9CBouncing%20Betty%E2%80%9D%20by,by%20the%20nearby%20grass%20vegetation>.

²⁶ "Third Reich." Holocaust Encyclopedia. <https://encyclopedia.ushmm.org/content/en/article/third-reich>.

²⁷ Gijoe. "6 Facts About the 'Bouncing Betty.'" Surplus Store UK. Last modified December 16, 2020. <https://www.surplusstore.co.uk/blog/facts-about-bouncing-betty/>.

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September 1, 1939 - September 2, 1945 - World War 2

Cluster munitions and antipersonnel mines were not used on a large scale until World War 2, when millions of bombs were deployed during the armed conflict. Even to this day, thousands of tons of UXOs left over from World War 2 remain in post-conflict areas. There have been several incidents with ERW from World War 2 in 2021; the discovery of an unexploded World War 2 bomb in Exeter, England resulted in a military response, thousands of civilians being evacuated, and extensive damage to environments and properties.²⁸ Poland faced a similar situation in October 2020, when the biggest WW2 bomb exploded underwater as divers attempted to defuse it.²⁹ Similarly, Germany cannot start construction projects because of soil contaminated with UXOs. The country uncovers over 2000 tons of UXO annually.

November 1, 1955 - April 30, 1975 - The Vietnam War

The Vietnam War, a battle between communist North Vietnam and South Vietnam, was a major conflict that contributed to the contamination of landmines, especially in Laos and Cambodia.³⁰ The war, which ended several decades ago, still has devastating impacts on the country's economy and the safety of its citizens. Cambodia has an estimated five million landmines, Laos with 80 million, the two nations having one of the highest numbers of amputees caused by unwittingly detonating a mine. As for Cambodia, the immense number of landmines planted by Vietnam made large portions of fields inaccessible and endangered the lives of countless Cambodian citizens.³¹ But Vietnam was not the only contributor: the United States forces also extensively used cluster munitions in bombing campaigns. Fortunately, the removal of UXOs has become safer and more refined recently. Since 2016, a Tanzanian organization called Apopo has used Gambian pouched rats to sniff out landmines and UXO throughout the area. As of August 2017, the furry creatures could sniff out 4500 mines and 36000 bombs, grenades, and bullets. In addition, demining organizations are also educating locals on the risks of UXOs, educating them on how to identify ERW and avoid UXO-related casualties.

December 24, 1979 - February 15, 1989 - Afghanistan: Soviet Invasion

²⁸ Adams, Charley. "What do we know about unexploded WW2 bombs?" BBC. Last modified March 4, 2021. <https://www.bbc.com/news/uk-england-devon-56243750>.

²⁹ "Video shows biggest WWII bomb found in Poland exploding while being defused." NBC News. <https://www.nbcnews.com/news/world/video-shows-biggest-wwii-bomb-found-poland-exploding-while-being-n1243257>.

³⁰ "What You Should Know About Landmines in Cambodia." World Nomads. <https://www.worldnomads.com/travel-safety/southeast-asia/cambodia/watch-your-step-cambodian-landmines>.

³¹ "The Threat of Explosive Remnants of War in A Luoi, Vietnam." Reliefweb. Last modified November 9, 2017. <https://reliefweb.int/report/viet-nam/threat-explosive-remnants-war-luoi-vietnam>.

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The issue of landmines in Afghanistan spans decades, all starting with the invasion of the Soviet Union in 1979 when the Soviet military deployed millions of landmines across Afghanistan. This was part of the Soviet's defensive strategy, a way to channel movement, protect socio-economic assets, defend military positions, and cause terror and confusion to the Afghan army.³² Following this, when the US launched its military attacks against the Taliban in late 2001, it contributed to a new and extensive period of contamination of ERW through explosives like cluster munitions. Because these ERW and landmines heavily harmed Afghanistan, they created a five-year plan (2016-2020) to remove the threat of explosive hazards. The plan facilitated development through organizing resources to clear affected sites in cooperation with government ministries, national and international NGOs, and private stakeholders. Afghanistan is home to the world's most extensive mine removal program, the country being successful in removing approximately 18.9 million ERW so far.³³ However, the recent Taliban takeover has made it difficult to ensure continuous success in removing explosive devices.

August 1, 2010 - The Convention on Cluster Munitions (CCM)

The Convention on Cluster Munitions is an international humanitarian treaty prohibiting cluster munitions' use, production, transfer, and stockpiling.³⁴ The CCM was opened for signature on December 3, 2008, and entered into force on August 1, 2010. Currently adopted by over 100 countries, the treaty obligations include stockpile destruction, clearance and risk education, victim assistance, international cooperation and assistance, transparency, and national implementation measures.³⁵ To date, the United States has not signed this convention, stating that cluster bombs are a legal weapon and are less harmful to civilians than other weapons.³⁶ According to the Cluster Munition Coalition (CMC), a Non-Governmental Organization (NGO) chaired and founded by Human Rights Watch, 35 states parties to the CCM have completed the destruction of their stocks, totaling approximately 1.5 million cluster munitions and 179 million submunitions. The CCM was also extended to Protocol V of the CCW, the Protocol on Explosive Remnants of War, the first multilateral agreement dealing with the wide range of UXOs and AXOs that

³² "In Afghanistan, clearing landmines to save lives." PBS. Last modified January 1, 2018.

<https://www.pbs.org/newshour/show/in-afghanistan-clearing-landmines-to-save-lives>.

³³ "Clearing Afghanistan's landmines one careful step a time." France 24. Last modified November 18, 2021.

<https://www.france24.com/en/live-news/20211118-clearing-afghanistan-s-landmines-one-careful-step-a-time>.

³⁴ "Treaty obligations." Convention on Cluster Munitions. <https://www.clusterconvention.org/treaty-obligations/>.

³⁵ United Nations Office for Disarmament Affairs.

<https://www.un.org/disarmament/convention-on-cluster-munitions/>.

³⁶ "US: Join Allies in Banning Cluster Munitions." Reliefweb. Last modified July 29, 2020.

<https://reliefweb.int/report/united-states-america/us-join-allies-banning-cluster-munitions>.

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regularly threaten civilians, peacekeepers, and humanitarian workers after the end of an armed conflict.³⁷ Essential aspects of such cooperation from the protocol include allowing access to affected areas by humanitarian mine operators and providing them with a security guarantee.

March 29, 2011 - June 17, 2022 - International Network on Explosive Weapons (INEW)

June 17, 2022, marks the milestone for finalizing an international agreement on using explosive ammunition in populated areas. The INEW, a political declaration, is a significant contribution to ensuring the protection of individuals from the extensive harm caused by bombings in cities, laying out a comprehensive agenda for further action from parties. These agendas will include implementing limits to curb the use of such weapons, monitoring the implementations of the agreement, and working to address the immediate and long-term effects on civilians, including infrastructure damage and providing support for victims and communities.³⁸ More than 65 states have participated in the process, including some major users of explosive devices. When the text is finalized, the INEW will call states to join the declaration at the earliest possible opportunity to demonstrate their commitment to improving the protection of civilians in conflict areas.

February 20, 2014 - Ongoing - Ukraine War: Russian use of cluster munitions

February 24, 2022, was the significant escalation of the Ukraine conflict that commenced in February 2014. Russia's armed forces have used at least six types of cluster munitions in attacks on Ukraine; similarly, Ukrainian forces appear to have used them at least once. According to Ukraine's State Emergency Service, 98,864 items of UXOs, including landmines and submunitions, have been cleared and destroyed as of May 9, 2022. However, during the seven weeks of conflict, 29 workers were maimed while doing demining work, and 73 were injured. In response to recent attacks, Human Rights Watch urges both countries to join the Convention on Cluster Munitions, an international ban treaty to protect and keep civilians and their homes safe.³⁹ Continuous use of such weapons will only worsen Europe's refugee crisis. Condemning such explosives in Ukraine will strengthen the global stigma against these weapons.

³⁷ "15th Conference of the High Contracting Parties to Protocol V on explosive remnants of war." Reliefweb. Last modified December 13, 2021.

<https://reliefweb.int/report/world/15th-conference-high-contracting-parties-protocol-v-explosive-remnants-war>.

³⁸ INEW.

<https://www.inew.org/final-meeting-to-adopt-explosive-weapons-declaration-marks-milestone-in-protection-of-civilians/>.

³⁹ "End Cluster Munition Attacks in Ukraine." Human Rights Watch. Last modified May 11, 2022.

<https://www.hrw.org/news/2022/05/11/end-cluster-munition-attacks-ukraine>.

January 12, 2021 - UNICEF Myanmar statement on fatal explosion

On January 12, 2021, on a farm near Sa Par Htar village, the detonation of an unexploded bomb killed a woman and injured five children. For many years, UNICEF has been deeply concerned due to the alarming increase of child fatalities by UXOs and landmines in Myanmar. The organization recognizes that the safety of children should be a primary focus in all contexts. Because children are more vulnerable compared to adults, they are more likely to suffer death or severe injuries from ERW. This dreadful incident prompted UNICEF to urge all parties in conflict to clear existing mines and discontinue the use of landmines to ensure protection for children and citizens living in areas of conflict. Not only this, but the organization encourages the Government of Myanmar to facilitate access to the provision of mine risk education in schools and conflicted areas as an attempt to allow children or community members to receive psychosocial support.⁴⁰

Position of Key Member Nations and Other Bodies

Vietnam

For decades, Vietnam was heavily contaminated with explosive remnants after the Vietnam war: approximately 745,177 cluster munitions were left over. Now, Quang Tri province, once a symbol of Vietnam's bloody fight, is a successful example of postwar reconstruction. Through concerted actions conducted by several provincial authorities, increased funding from the United States, and fruitful cooperation with local government and NGOs, the province has reduced the number of UXO casualties from thousands to hundreds to almost zero today.⁴¹ In addition, in 2015, Quang Tri province created a war legacy coordination center named the Quang Tri Mine Action Center (QTMAC). The QTMAC has been significant in determining priorities regarding ERW and UXO clean-ups.⁴² Quang Tri's mission to a clear path demonstrates the innovative and effective benefits that local governments can influence in peacebuilding.

Despite the positive outcomes and actions from Vietnam, the nation signed (in 1980) but abstained from ratifying one of the crucial treaties regarding the issues, the Convention on Conventional

⁴⁰ "UNICEF Myanmar Statement on the fatal explosion of an ordnance in Minbya Town." UNICEF. Last modified January 13, 2021.

<https://www.unicef.org/myanmar/press-releases/unicef-myanmar-statement-fatal-explosion-ordnance-minbya-town>.

⁴¹ "The Threat of Explosive Remnants of War in A Luoi, Vietnam." Reliefweb. Last modified November 9, 2017.

<https://reliefweb.int/report/viet-nam/threat-explosive-remnants-war-luoi-vietnam>.

⁴² Dang, Andrew Wells. "Clearing Path Peace in Vietnam." United States Institute of Peace. Last modified June 16, 2022. <https://www.usip.org/publications/2022/06/clearing-path-peace-vietnam>.

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Weapons (CCW). They also refrained from voting on a key U.N. General Assembly (UNGA) resolution, which urged nations not part of the Convention on Cluster Munitions to "join as soon as possible." If Vietnam decides to ratify the CCW in the future, the nation will receive great benefits. Citizens and officials will be able to take feasible precautions to protect the population against these dangerous devices.

United States of America

The United States is no stranger to explosives, specifically cluster munitions. In the past, between the years 2001 through 2002, the U.S. dropped an estimated 1228 cluster bombs containing 248,056 submunitions around Afghanistan. They were undoubtedly a massive contributor to Vietnam's devastating number of ERW. Since the 2003 invasion of Iraq—with the exception of a minor attack in Yemen in 2009—the United States has not dropped any cluster munitions; their last budget funds to produce new cluster munitions was over a decade ago.⁴³

On that note, the United States has made several other positive contributions, the nation sharing an internal concern about the humanitarian effects of the indiscriminate use of all weapons. The USA spends more than any other nation to decrease and eliminate the risk to civilians from land mines and all ERW. The United States has supported the Vietnam National Mine Action Center (VNMAC) by funding large-scale surveys and ERW clean-up programs in Quang Tri to support the provincial government's goal to become Unexploded Explosive Ordnance (UXO) impact-free by 2025.⁴⁴ Additionally, the U.S. invested over \$166 million in Conventional Weapons Destruction (CWD) programs between 1993 and 2020, which have successfully cleared thousands of mines and UXO, provided survivors assistance, and supported national capacity development. The U.S. has also provided prosthetics, physical rehabilitation services, and vocational training for victims of ERW.⁴⁵ The various programs the United States has funded for ERW have produced tangible, measurable, and positive results.

Afghanistan

⁴³ "Key Topics – Office of Weapons Removal and Abatement." US Department of State. <https://www.state.gov/key-topics-office-of-weapons-removal-and-abatement/>.

⁴⁴ "Congressional Research Service." Cluster Munitions: Background and Issues for Congress. Last modified March 9, 2022. <https://sgp.fas.org/crs/weapons/RS22907.pdf>.

⁴⁵ "Cluster Munition Ban Policy." Landmine and Cluster Munition Policy. Last modified November 24, 2020. <http://www.the-monitor.org/en-gb/reports/2020/united-states/cluster-munition-ban-policy.aspx#:~:text=The%20US%20last%20used%20cluster,manufactured%20them%20for%20foreign%20sales.>

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Weeks after the Taliban invaded Afghanistan back in 2021, families who fled the conflict in one Southern Village returned home to find something odd: the cricket ground had been circled in rocks painted red and white by the Hazardous Area Life-Support Organization (HALO trust). White symbolized a space where children were safe to play; on the other hand, red stones signified the presence of buried landmines and ERW that the organization could detect through metal detectors.⁴⁶

Since 1988, an estimated 41,000 Afghan children have been killed or maimed by UXO and ERW; most of these casualties have been because these deadly weapons were unknowingly picked up and played with. However, Afghanistan had been contaminated with ERW long before the recent Taliban invasion. The land was polluted with tons of military-grade anti-vehicle landmines, improvised anti-personnel mines, and explosive devices (IED), resulting from the raging conflict with the Soviet forces in the 1970s.⁴⁷ On a positive note, Afghanistan has received much support from organizations such as UNMAS, UNICEF, UNHCR, and the World Bank. One major project that has been a starting point for recovery in Afghanistan is the Area-Based Approach for Development Emergency Initiative (ABADEI). The project was launched in March 2022 by the Danish Refugee Council (DRC) and funded by the UNDP. The primary objective of the ABADEI is to support communities in rural Afghanistan by providing basic human necessities, including food, money and health. Specifically for ERW, the initiative has conducted ERW risk education, discussing and teaching life-saving information and skills, including mitigating the risks of ERW and preventing deaths. Since then, over 400,000 women, men, and children have received risk education from the ABADEI.⁴⁸

Japan

Seventy-six years after the Battle of Okinawa, tons of unexploded shells still lie beneath the grounds, waiting like time bombs. The Battle of Okinawa started in 1945, lasting around three months. In those three months of conflict, forces of the United States unleashed and deployed an immense volume of explosives around the land. This "Typhoon of Steel" injured and killed many civilians and Japanese soldiers; it was documented to be so relentlessly violent that it altered the island's landscape.⁴⁹ According to a prefectural estimate, after the Americans occupied Okinawa in 1945, residents and the U.S. military

⁴⁶ "The Transition to Peace and Recovery in Rural Afghanistan." Danish Refugee Council. Last modified July 7, 2022. <https://drc.ngo/it-matters/current-affairs/2022/7/the-transition-to-peace-and-recovery-in-rural-afghanistan/>.

⁴⁷ "Afghanistan's road to peace paved with remnants of war." AA. Last modified July 4, 2021.

<https://www.aa.com.tr/en/asia-pacific/afghanistan-s-road-to-peace-paved-with-remnants-of-war/2200819>.

⁴⁸ "Clearing Afghanistan's landmines one careful step a time." France 24. Last modified November 18, 2021.

<https://www.france24.com/en/live-news/20211118-clearing-afghanistan-s-landmines-one-careful-step-a-time>

⁴⁹ "76 years after Battle of Okinawa, tons of unexploded US shells lie hidden beneath ground." The Mainichi. Last modified June 24, 2021. <https://mainichi.jp/english/articles/20210623/p2a/00m/0na/025000c>.

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disposed of 5,500 tons of unexploded ordnance. After the cessation of the American occupation and Okinawa's return to Japanese sovereignty, the self-defense force disposed of 2,094 more tons of unexploded remnants. Disregarding the 500 tons of shells thought to be buried so deep in the mountains and under the seabed that they will likely never be found, an estimated 1,906 tons of explosives are thought to remain. Ultimately, unexploded ordnances left over from decades ago will keep claiming the lives of civilians living in contaminated communities of Japan.

Japan has been active in conventions and policies regarding explosives, especially cluster munitions. Japan signed the CCM on December 3, 2008; the nation was among the first 30 ratifications to trigger the convention. Japan's national implementation legislation, enacted in 2009, bans the possession and production of all cluster munitions and affirms the nation's obligation to dispose of its stockpiles of cluster munitions. Japan has also been a diligent participant in the Oslo Process, proactively engages in the work of the CCM, and attends every inter-sessional meeting of the Geneva Convention, the most recent being in 2015.⁵⁰ After Japan announced the destruction of their stockpile of munitions in 2015, they assured their continuous participation in promoting the CCM and acting in clearance and victim assistance.

Russian Federation

Russia is another significant producer and exporter of cluster munitions. Even until 2021, the country proceeded to advance models of cluster munitions. Russia is a major nation that has refrained from signing and ratifying most conventions and policies on explosives and munitions. The nation is a vocal critic of the CCM, stating they cannot partake in the convention because it views cluster munitions as legitimate weapons, Russia states that weapons banned by the CCM perform an important role in the nation's defense interests.⁵¹

Russia's current use of cluster munitions and explosives in Ukraine is leading to a massive contamination of ERW in Ukraine. Similarly, during the Russia-Syria military operation in 2015, both nations were accused of deploying cluster munitions. Although Russia and Syria were and still aren't members of the Convention on Cluster Munitions, they are still bound by international humanitarian law,

⁵⁰ "Cluster Munition Ban Policy." The Monitor. Last modified August 10, 2015.
<http://www.the-monitor.org/en-gb/reports/2020/japan/cluster-munition-ban-policy.aspx>.

⁵¹ "Russian Federation." Landmine and Cluster Munition Monitor. Last modified May 17, 2022.
<http://www.the-monitor.org/en-gb/reports/2021/russian-federation/cluster-munition-ban-policy.aspx>.

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or the laws of war, which prohibits indiscriminate attacks.⁵² Organizations have continually urged Russia to stop using cluster munitions; however, the nation has continuously refused to do so, harming civilians in conflict areas.

Ukraine

Ukraine's story and history with explosive remnants are quite devastating. Before Russia even invaded Ukraine in February, the nation had already spent decades working to clean and demine UXO left over from WW2. By 2019, Ukraine had successfully destroyed more than 7000 landmines and ERW, paving a path for a peaceful and safer future.⁵³ However, Ukraine's progress was reversed in weeks when Russia invaded Ukraine. Since the beginning of the war, Russia was documented to have used at least six types of cluster munitions; the repeated and continuous use of these ammunitions has killed hundreds of citizens and severely damaged essential infrastructures like hospitals and schools. On March 13, a cluster munition rocket detonated in Ukraine, killing nine waiting individuals at a cash machine. Victims have lost body parts, burned their hands, ruptured ear drums, and even been separated from family members.⁵⁴ Some unexploded bombs launched are even attached with colorful ribbons, drawing curiosity and attention from vulnerable children. Many Ukrainian citizens are overwhelmed by the number of ERW lying around their community. In turn, they feel compelled to clear them themselves, increasing the number of ERW-related casualties.⁵⁵

Ukrainian national authorities have been locating, recording, and destroying explosive devices and mines (around 80,000) with support from the Mine Action Information Management (IM). The country has also accepted foreign aid from the United States, Switzerland, and the Netherlands for humanitarian demining and conducting mine risk education and awareness.⁵⁶ Despite the continuous

⁵² "Russia/Syria: Widespread New Cluster Munition Use." Human Rights Watch. Last modified July 28, 2016. <https://www.hrw.org/news/2016/07/28/russia/syria-widespread-new-cluster-munition-use>.

⁵³ Atherton, Kelsey D. "Why the threat of explosives will persist long after the war in Ukraine ends." Popsci. Last modified April 4, 2022. <https://www.popsci.com/technology/ukraine-unexploded-ordinance/>.

⁵⁴ Bearak, Max. "Clearing the deadly litter of unexploded Russian bombs in Ukraine." The Washington Post. Last modified April 15, 2022.

<https://www.washingtonpost.com/world/2022/04/15/ukraine-clearing-unexploded-russian-bombs-missiles/>.

⁵⁵ "Panel: 'The Evolving Crisis in Ukraine – How Different Parts of the USG Are Reacting in Real Time.'" US Department of State. Last modified May 26, 2022.

<https://www.state.gov/panel-the-evolving-crisis-in-ukraine-how-different-parts-of-the-usg-are-reacting-in-real-time/>.

⁵⁶ "Clearing Landmines in Ukraine Might Take Decades."

Reliefweb. <https://reliefweb.int/report/ukraine/clearing-landmines-ukraine-may-take-decades-work-find-map-and-re-move-them-has-already>.

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efforts to support and clean Ukraine, the immense volume of explosives being deployed has made it almost impossible to ensure an optimistic future for citizens. ERW resulting from the Russia-Ukrainian conflict will undoubtedly leave Ukraine's citizens with fear and devastation. These ERW will exacerbate global food insecurity by impacting the nation's food production and supply chain. Post-conflict, humanitarian workers and organizations will be unable to access Ukraine's contaminated areas, and the restoration of critical civilian infrastructure will be hindered.⁵⁷ Without a doubt, the aftermath of the brutal conflict will continue the war for decades.

United Nations (U.N.)

The United Nations have been a prominent organization assisting ERW-related issues. Under the United Nations are three different offices that have significantly cooperated to reduce the impact of ERW; besides the three listed offices, there have also been major efforts from branches like the Office for Disarmament Affairs (UNODA).

1. Office for the Coordination of Humanitarian Affairs (UNOCHA)

The OCHA has been helping member states promote and contribute to a change in practice toward explosive weapons in populated communities. UNOCHA has previously been in charge of publishing several different texts, the first being a comprehensive document discussing the humanitarian impacts of policies restricting the use of certain explosive weapons. The second is a collection of studies emphasizing the dangers and impact of explosive weaponry. Both documents allow individuals to gain awareness of the issue and understand the positive effects of having conventions and treaties restricting the use of explosives.⁵⁸ The organization also created a menu of indicators in collaboration with the U.N. Institute for Disarmament Research (UNIDIR) to help partners reinforce data collection capacity. An extensive research paper was also compiled, discussing specific changes to develop military practices to decrease the dangers to civilians from explosive ammunition.

2. Mine Action Service (UNMAS)

UNMAS, and the United Nations Office for Project Services (UNOPS), developed an Explosive Detection Dog Quality Standard to ensure safe and effective operations for teams working with explosive hazards. By smelling and recognizing chemical vapors and volatiles, these dogs can identify active

⁵⁷ "Intense and Lasting Harm: Cluster Munition Attacks in Ukraine [EN/RU]." Reliefweb. Last modified may 11, 2022. <https://reliefweb.int/report/ukraine/intense-and-lasting-harm-cluster-munition-attacks-ukraine-enru>.

⁵⁸ "Explosive Weapons in Populated Areas." UNOCHA. <https://www.unocha.org/themes/explosive-weapons-populated-areas>.

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explosives, aiding humanitarian workers in effectively identifying and removing these hazards.⁵⁹ The quality standard is implemented in 18 locations globally, specifically in three UNMAS programs in Mali, Somalia, and South Sudan. To this day, there are 194 accredited dogs. Additionally, UNMAS has produced a detailed safety handbook for people working in environments contaminated by explosives. The manual discusses explosives threats, recognizing dangerous areas, safety advice, emergency procedures, and assisting victims.

Not only this, but UNMAS has been a significant contributor to several ERW clean-up projects. For example, the organization mobilized and trained community-based clearance and liaison individuals in Somalia. In the Democratic Republic of Congo, UNMAS worked with national authorities to survey out and clean past areas of conflict to allow vulnerable communities to move freely. UNMAS has also greatly assisted South Sudan, Iraq, and Libya. The organization has contributed to increasing food security, creating food distribution centers, integrating emergency food parcels, enabling safe human interventions, facilitating infrastructure reconstruction, re-establishing essential services, and providing extensive explosive ordnance risk education.⁶⁰ UNMAS has utilized various materials, including billboards, TV clips, and virtual reality goggles, to coordinate several ERW risk education in different communities. The organization has strived to create a healthy and safe future for affected communities.

3. United Nations Children Fund (UNICEF)

Over several years, UNICEF has created guidance on child-focused victim assistance, called for global commitment to prevent the use of certain explosive weapons in larger communities, and assisted governments and humanitarian actors in reducing the risks ERW presents to children.⁶¹ The organization works to aid victims by providing medical assistance, mental support, artificial limbs, and education. Since 2014, UNICEF has supported approximately 30 million children in 25 nations to receive life-saving and essential ERW education, primarily in regions affected by ongoing conflicts.⁶² UNICEF has also assisted in rehabilitating children harmed by ERW in more than ten countries.

International Committee of the Red Cross (ICRC)

⁵⁹ "Explosive Detection Dogs." UNOPS. <https://www.unops.org/news-and-stories/stories/explosive-detection-dogs>.

⁶⁰ "Mine Action." United Nations Peacekeeping. <https://peacekeeping.un.org/en/mine-action->

⁶¹ "Assistance to Victims of Landmines and Explosive Remnants of War." UNICEF. <https://www.unicef.org/documents/assistance-victims-landmines-and-explosive-remnants-war>.

⁶² "Protecting children from explosive weapons." UNICEF. <https://www.unicef.org/protection/protecting-children-from-explosive-weapons#:~:text=To%20keep%20children%20safe%20from,of%20war%20present%20to%20children>.

The ICRC is a humanitarian organization providing protection and assistance to war and armed violence victims. The ICRC has acted on several things concerning ERW, including mitigating impacted populations of ERW contamination through a flexible, multidisciplinary procedure. Essentially, the ICRC minimizes individuals' exposure to both conventional and non-conventional hazards: by raising awareness of dangers, promoting safe behavior, conducting risk reduction activities, and aiding fallen victims through prehospital decontamination, physical rehabilitation, surgery, and economic security awareness.⁶³ The ICRC works include a combination of several sectors:

1. Information management - encompasses the extensive process of assessing, analyzing, mapping, and disseminating collected data connected to weapon contamination. The data incorporates the location of weapon contamination, specific dates and time stamps of casualties, profiles of victims, and different types of at-risk behaviors. These actions allow stakeholders to identify dangerous areas and plan activities to minimize the possibility of future incidents.
2. Risk awareness and safe behavior - identifies the patterns of behaviors that expose people to the effects of ERW and create and promote provisions to reduce ERW exposure by cooperating with impacted communities. The ICRC conducts interactive risk awareness sessions, liaises with weapon clearance workers, and promotes International Humanitarian Law (IHL) regulations relating to weapon use.
3. Risk reduction - when countries are affected by conflict, citizens usually have no choice but to travel through ERW polluted areas. The ICRC minimizes the need for citizens to travel through polluted areas by marking safe areas, supplying replacement fuel and water sources, extending microloans, or providing grants for small businesses.
4. Surveying and clearance - the ICRC directly surveys and clears contaminated areas. In situations where ERW blocks safe access to essential infrastructure or prevents the ICRC from carrying out humanitarian activities, the organization deploys explosive ordnance disposal (EOD) specialists, who are able to guide humanitarian workers in safely removing hazards through the use of protective equipment and delicate procedures. On a smaller scale, they also strengthened their medical support expertise by developing specialized equipment kits and training for ERW-related cases.⁶⁴

⁶³ "What is the ICRC doing to reduce the effects of weapon contamination?" ICRC. Last modified April 3, 2017. <https://www.icrc.org/en/document/overview-mine-action>.

⁶⁴ "Ethiopia: Saving lives through explosive ordnance disposal practice." ICRC. Last modified April 18, 2017. <https://www.icrc.org/en/document/ethiopia-saving-lives-through-explosive-ordnance-disposal-practice>.

Geneva International Center for Humanitarian Demining (GICHD)

Geneva International Centre for Humanitarian Demining is an organization focusing on decreasing harm to communities and individuals caused by ERW, specifically landmines, cluster munitions, and ammunition stockpiles. The GICHD develops sectors for the benefit of several partners: donors, the United Nations, NGOs, international/regional organizations, national and local authorities, commercial companies, and academia.⁶⁵ The center approaches this by combining four lines of service: field support focused on advice and training, multilateral work focused on norms and standards, research and development focused on cutting-edge solutions, and facilitating dialogue and cooperation.

The GICHD separates into several departments to maximize their organization's efficiency and effectiveness of their organization; these sectors include Ammunition Management Advisory Team (AMAT), Explosive Ordnance Risk Education (EEYORE), Cooperation Programmes, Information Management System for Mine Action (IMSMA), Mine Action Strategies and The Gender and Mine Action Programme (GMAP). The EEYORE and Mine Action Strategies have been the most significant for this agenda. GICHD contributes to efforts to strengthen the profile of EEYORE, improve the delivery of effective EEYORE, respond to current and new challenges, foster new partnerships, and encourage innovation. Since 2013, GICHD has also supported the developing, implementing, and review of national strategies in several mines/ERW-affected countries, including Afghanistan, Bosnia and Herzegovina, Cambodia, the Democratic Republic of Congo, Kosovo, South Sudan, Tajikistan, Sri Lanka, Ukraine, and Zimbabwe.⁶⁶

Suggested Solutions

Dealing with the issue of explosive remnants requires both short-term and long-term solutions. The first set of solutions should include several simple and practical actions. A significant problem is the number of countries unwilling to ratify conventions like the Convention on Cluster Munitions (CCM) and the Geneva Convention, both of which aim to ban the transport and production of explosives. Large corporations and organizations should accordingly provide incentives to nations while simultaneously communicating with respective government individuals to attempt to come to a consensus. These incentives will vary depending on a nation's financial and economic status; therefore, it is difficult to list these explicitly. For example, considering financial or medical aid as an incentive, the probability of

⁶⁵ "About us." GICHD. <https://www.gichd.org/en/the-gichd/about-us/>.

⁶⁶ "About us." GICHD.

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swaying LEDCs will be substantially more than MEDCs. Nevertheless, the outcomes and efforts should be made to foster any partnership. On the same note, organizations should also provide incentives to larger businesses to aid LEDCs in possessing technology and professionals that would be essential for demining operations. Several incentives could be considered: fiscal incentives, privileged treatment and resources.

The lack of successful ERW risk education is a crucial problem in which citizens' safety is being compromised. ERW risk education facilitators should take precise measures to ensure the feasibility of such programs. These steps separate into several phases:

1. The needs assessment should be the first stage; including identifying the problem among a target audience and establishing an ongoing information collection system to increase public awareness. Reasons for casualties should be considered since different underlying reasons require a different response and strategy. The primary conditions of the environment should be meticulously analyzed so that programs emphasize the right message and focus.
2. Program planning and communication approaches should be implemented based on the information gathered from the initial phase. Effective MRE ensures a two-way exchange of information; program creators must balance teaching techniques and the audience's learning style to guarantee that the information is properly absorbed.
3. Training of educators should happen simultaneously, and specialized professionals from experienced organizations like the UN or GICHD should support workers in gaining the tools needed. If physical training is unavailable, educators can also utilize completed guidebooks from the organizations since they were specially made to aid workers in developing effective ERW risk education.
4. Lecture method/participatory activities is the phase where education will be carried out. However, both tactics should be incorporated into sessions, depending on the audience. Lectures should encourage the independent development of analytical skills for older audiences while participatory activities such as peer discussions and problem-solving activities should be applied to younger individuals. Both activities should focus on having trainees express their understanding and knowledge of the topic. The aim is to embed the ERW risk education to the audience.

ERW awareness, properly conducted, should generate substantial data that can be analyzed for its own operational needs and by other relevant mine action disciplines. Most programs lack concrete,

community-originated, socio-economic data, which hampers the accuracy in planning, priority setting, and operations. An example is when a nationwide system for collecting data on UXO casualties was launched in Afghanistan in 1998 to improve the reporting, exchange, and information on victims. Facilitators, stakeholders, and national authorities should gather relevant data to support the advancement of courses.

Although the growth of technology advances by Western militaries for the removal of ERW in the modern century, the majority of humanitarian demining solely relies on mid-20th century technology (metal detectors). While the efforts to curb the international use of explosives and landmines have been majorly successful, the barrier of humanitarian demining technology contributes to the unfortunate deaths of deminers and civilians. Although multi-faceted demining machines such as remote-controlled or semi-autonomous will likely become available on the market in the future, the time it will take for these technologies to be released and perfected could be decades, and costs would be expensive.

Mine cleaning organizations should start by integrating existing devices into their demining operations. For example, an area preparation tractor, an Italian-based vineyard tractor with armor and blast-resistant wheels, is a vehicle that can clear vegetation and knock off the fuses of fragmentation mines, thereby reducing the hazard for the clearance team that follows.⁶⁷ Advanced excavators like the Arjun Demining System could also be considered. The system rakes through 20cm of soil, allowing deminers to spot explosives buried underground quickly; this makes it increasingly possible to examine and hand rake to the ground to search for additional ERW⁶⁸ - this is considered an exceptionally cost-efficient demining equipment. Sensors like the Ground Penetrating Radar (GPR) or dual and multi-sensor detectors can also be deployed on vehicles since they can side scan and vertical scan, increasing the resolution to reliably detect anti-tank mines and IEDs. GPR works by sensing a tiny pulse of energy into the ground and recording the strength of reflected signals and the time it takes to return to the receiver;⁶⁹ Consequently, it can detect a wide range of buried utilities, including metal and plastic explosive devices. There is also hope for large organizations to fund demining centers to possess these technologies. For example, previously, the UN Department of Peace Operations and UNMAS had

⁶⁷ "Survivable Demining Tractor and Tools." Researchgate.

https://www.researchgate.net/figure/Survivable-Demining-Tractor-and-Tools-SDTT-a-Mine-Clearing-Survivable-Vehicle-MCSV_fig1_269127001.

⁶⁸ "Arjun Demining System." Nolandmines. https://www.nolandmines.com/Arjun_Demining_System.html.

⁶⁹ "WHAT IS GROUND PENETRATING RADAR (GPR) & HOW DOES IT WORK?" Soft Dig. Last modified January 31, 2020. <https://www.softdig.com/blog/gpr-ground-penetrating-radar-work/>.

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accepted the Panel of Experts on Technology and Innovation in UN peacekeeping recommendation on new demining technologies to enhance the mobility of peacekeepers.⁷⁰ The European Union (EU) and NATO's Science for Peace and Security Program have supported similar activities. Therefore, there is a high probability that the listed organizations will be willing to provide funding for ERW clearing organizations to obtain the devices.

According to the International Committee of the Red Cross (ICRC), war has rules, the major one being that parties in conflict do not attack civilians. This is also emphasized in the IHL, that indiscriminate attacks are prohibited and considered a war crime. The use of explosives that harm civilians post-conflict violates these rules. Limiting the impact of warfare on civilians, especially that of women and children, should be a priority before, during, and after an armed conflict. Therefore, another solution is encouraging the integration of an avoidance policy in the CCW or Geneva Convention to effectively counter violations of international humanitarian laws. The focus of the policy would not be to ban the use of explosives in populated areas, imply that such weapons are unlawful, or amend related laws. The policy would essentially encourage nations to change of course of action when dealing with and using explosives during an armed conflict. This policy would call on states and parties to avoid using explosive weapons that may have a wide scaled impact on populated areas. There would be a combination of mitigation measures to ensure that the weapons used in conflict circumstances do not risk civilians. These measures would range from pre-conflict to post-conflict actions:

- changing the munitions, fuze, or warhead to ensure the damages are solely contained on the target (the opposing party),
- establishing and maintaining minimum safety distance from civilians, and
- ensuring that the reverberating effects of the attacks are minimized to the greatest extent.

There should also be an emphasis on the importance of critical civilian infrastructure and essential everyday services and the risks this entails if they happen to be damaged during a conflict. The policies should highlight that involved parties should take all tactical and operational measures to decrease civilian casualties in populated areas and to avoid displacement and harm to civilians.

Although an avoidance policy may be effective for some nations, parties will always be unwilling to consider these safer options. In these circumstances, stronger measures should be taken, sanctions or penalties. Nations participating in any activities resisting the ratification of any related conventions or the

⁷⁰ United Nations Meetings Coverage and Press Releases. Last modified August 18, 2021.. <http://Harness Digital Technology to Protect Peacekeepers, Civilians, Security Council Urges, Adopting Presidential Statement>.

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continuous use of explosive weapons in populated areas should be monitored. Control over conventional arms exports and dual-use goods should be implemented. There should be pursuance of a restriction of arms export in line with the policy principles of the Federal Government for the Export of War Weapons and Other Military Equipment (a governing authority in Germany), ensuring that only licensed individuals with valid reasons can possess and transport these weapons. The application for export licenses should be determined case-by-case to maintain peace, security, and stability in the respective region. Suppose there are legitimate reasons to suspect that the ammunition or weapons are being abused for internal repression or other forms of continuous and systematic human rights violations. In that case, no license should be granted as a general rule. Delivers with potential conflict-exacerbating effects should similarly not be authorized. Mandating these operations will be essential to limit the number of explosive weapons used during an armed conflict. These penalties should only be lifted if nations show signs of compliance with the aforementioned policy.

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