Summary

Explosive remnants of war

Unexploded ordnance and post-conflict communities

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"One child was killed and another injured near here. They were carrying sugar cane and one was also carrying some sort of UXO. One of them dropped the UXO and it exploded. My grandchildren heard the bang... they ran up to get the scrap metal but instead they found two children terribly injured. One was torn open all down his front with his intestines exposed – his body was torn apart. The other child was bleeding from lots of cuts all over his body and a big wound to his stomach. When my children came home they were shocked and shivering at what they had seen."

Grandmother, Salao village, Cambodia 2001

The disastrous humanitarian impact that landmines have had on civilian populations in the aftermath of war has been well publicised. But abandoned explosive ordnance and unexploded ordnance (UXO) also remain after almost every conflict. These too present a threat to civilian communities and hold back reconstruction but, unlike landmines, they are an accidental by-product of conflict. The impact they have generally results from technical failure, rather than deliberate design. They have either failed to operate (in the case of UXO) or have simply been left behind (in the case of abandoned explosive ordnance).

UXO has an enduring impact in many post-conflict communities. In recent years Cambodia, Kosovo and Eritrea have experienced levels of deaths and injuries from UXO equivalent to those caused by landmines.

But, unlike landmines, there is presently no provision in international humanitarian law addressing the problem of unexploded ordnance, nor any legal obligation for the users of explosive munitions to ensure that civilians come to no harm from the remnants of war.

This report examines the many different and complex relationships that individuals and communities develop with UXO in their environment.

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UXO

'Explosive remnants of war' is a broad term that includes all types of explosive weapons, including anti-personnel and anti-tank landmines, unexploded ordnance and abandoned explosive ordnance. This report is concerned with unexploded ordnance (UXO), comprising explosive weapons, other than landmines, in many different conditions: artillery shells, grenades, mortars, rockets and air-dropped bombs as well as explosive submunitions (or bomblets) that form the contents of cluster bombs.

Most items of ordnance contain a large explosive charge, as well as a metal fragmentation casing that is designed to break up and injure people at a distance from the blast.

Items of UXO can be whole or partial. A whole item may have more potential for lethal damage but a small fuze, removed and abandoned, can be particularly sensitive and prone to detonation. UXO may be clearly visible on the surface, hidden in undergrowth, or buried beneath the ground.

Items of UXO are unpredictable: their likelihood of detonating may depend on whether or not the item has been fired, the extent of corrosion or degradation, and the specific arming and fuzing mechanisms of the device. Similar items may respond very differently to the same action – one may be moved without effect, whilst another may detonate. Some items may be moved repeatedly before detonating and others may not detonate at all.

There is little quantitative data available to show which types of munition are most problematic. This research found that the impact of UXO depends on the type of contamination and the social and economic circumstances of the affected communities, rather than munition type. However, greater problems are caused where there is a density of contamination, or where UXO is below the surface of the ground. For these reasons, in the case study areas researched for this report, cluster submunitions were especially problematic.

UXO accidents

UXO accidents generally result in the death or injury of one or more people. Unlike many anti-personnel mines, which are designed to incapacitate rather than kill, accidents involving other explosive ordnance are more likely to kill primary victims (those people who actually initiate the explosion).

Common UXO injuries include multiple traumatic amputations of limbs; burns; puncture wounds; lacerations from fragmentation; ruptured eardrums; and blindness from fragmentation or from the blast. At a greater distance from the blast, individuals are likely to suffer less concentrated puncture wounds from fragmentation. The range at which this can be lethal depends upon the particular weapon and can vary from tens to many hundreds of metres.

The demographic profile of UXO accidents generally differs from that of landmine accidents. The pattern of deaths and injuries resulting from accidental interaction with UXO is likely to be linked to the nature and location of economic activities that occupy different groups within the community.

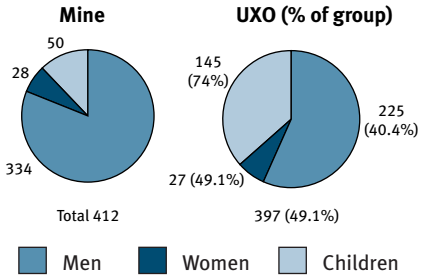
Accident statistics collected in Kosovo from June 1999 to May 2001 show that UXO caused a greater proportion of deaths than landmines. Nearly two-thirds of UXO casualties in Kosovo were children. In Cambodia, the number of children injured or killed by UXO (August 2000 to end July 2001) was three times the equivalent figure for landmines.

In Eritrea, since May 2000, UXO (including submunitions and fuzes) has accounted for 72 per cent of deaths and injuries where the type of device that caused the accident is known. In parts of Afghanistan, commonly cited as one of the most mine-affected countries in the world, 64 per cent of accidents were caused by UXO as opposed to landmines in 1997 and 1998.

Kosovo accident victims: people injured or killed by device type

Device type	Injured	Killed (% of type)
Landmine	221	33 (12.9)
Cluster submunition	97	45 (31.7)
Other UXO	19	8 (29.6)
Unknown	44	3 (6.4)
Total	381	89 (18.9)

Cambodia accident victims: men, women & children by landmine or UXO



Reasons for UXO accidents

UXO can be on the surface or buried; surface UXO is visible and people can choose how they interact with it. Sub-surface UXO rarely detonates as a result of people walking over it; more often it detonates from intrusive impacts, such as ploughing, or is uncovered and interacted with as surface UXO.

Activities at the time of UXO accidents

A high proportion of UXO accidents occur when people are going about their daily economic activities. In some circumstances people deliberately interact with UXO that they find in their environment, moving it so that land can be used or to stop children from playing with it.

Bystanders

The potential for UXO to harm multiple victims over a wide area is illustrated by the significant proportion of UXO victims injured as a result of standing or passing near to explosions that other people initiated: 30 per cent in Kosovo compared with 18 per cent in the case of mines.

Cambodia, August 2000 to July 2001

Cambodia UXO and landmine accidents by activity at the time of accident (per cent)

Activity	Mine	UXO
Gathering resources	25	9
Tampering	7	66
Farming	33	16
Travelling	27	4
Military activity	7	3
Other	1	2

Kosovo, June 1999 to May 2001

Kosovo UXO and landmine accidents by activity at the time of accident (per cent)

Activity	Mine	UXO
Gathering resources	11	5
Tampering	2	12
Farming	2	4
Travelling	18	4
Playing	2	8
Passing/standing nearby	18	30
Demining	13	6
Tending animals	10	18
Military activity	6	3
Unknown and other	18	13

The impact of UXO accidents

The obvious immediate impact of UXO accidents is casualties, including child survivors who will spend the bulk of their lives coping with the legacy of an explosion. But there is a wider impact on whole communities.

Fear

The prospect of death and injury creates fear. The presence of UXO can stop people from using land that would otherwise provide them with a resource, or it can lead to land being used less productively. Fear of UXO presents a serious obstacle to those overcoming the psychological trauma of war and may be a significant barrier to the establishment of peace.

People do not necessarily fear walking on land where UXO may be buried, but they do fear striking sub-surface UXO when they are breaking the ground to farm or build houses. They also fear that their children will find surface-lying UXO and play with it recklessly. In Eritrea, for example, this led to people moving unexploded cluster munitions.

Economic impact

This research found the presence of UXO prevents people safely using land for agriculture and infrastructure, for example collecting wood, growing cash crops and rebuilding houses. Where people fear to use land because of the presence or suspected presence of UXO, the economy of the family and the wider community is affected. The denial of agricultural land can leave a family poverty-stricken unless it has other skills to fall back on, particularly in predominantly subsistence communities.

Land denial from UXO is not always absolute and communities will endeavour to cope with the problem. This usually involves moving items of ordnance out of the way to a place that is not being used or leaving items where they are found and working around them.

Reconstruction and development

The presence of UXO prevents the use and rehabilitation of infrastructure and community resources, including housing, water and irrigation systems, paths between villages, schools, clinics and markets. These commonly need UXO clearance to allow their use or construction to go ahead.

Unexploded ordnance can also have a severe effect on development, exacerbating poverty by impeding agriculture and the resumption of commercial activities. For example, this research found the reconstruction of a company in Kosovo has been halted by the presence of large quantities of UXO; and in Cambodia, UXO stopped villagers in subsistence communities growing food or opening up new land for farming.

The nature of land denial

The denial of one area of land can shift patterns of land use around the community. Suspect land, when it is not completely abandoned, may be used for different, less productive, purposes in an attempt to minimise risk. In addition, where other economic options are available, people are clearly less likely to feel forced to take the risk of using contaminated land.

This research identified the factors that erode people's confidence in working around contamination effectively, leading to a greater likelihood of more complete land or resource denial.

Ultimately, land denial not only affects economic productivity; it can also produce wholesale change in traditional social and economic practices. At its most extreme, whole communities may be abandoned.

Quantity and type of UXO

'Area contamination' occurs where large quantities of UXO are believed to occupy a particular area. Unlike small numbers of individual items, which are sometimes worked around or moved, area contamination must be eliminated if the land is to be put to any sort of productive use. Area contamination is likely where there is:

- prolonged fighting over relatively fixed positions
- cluster bomb strikes
- abandoned ordnance stores
- abandoned firing ranges.

Sub-surface UXO

For people wishing to work the land, sub-surface UXO presents a risk of unwitting and violent contact. The force with which someone may strike a UXO when they are digging could well exceed the force they would exert if they were interacting with it deliberately. People may be willing to walk on the ground but they may not be happy to plough, clear vegetation or dig for construction in case they strike UXO. This clearly affects the extent to which land can be put to productive use, whether for agriculture, housing or infrastructure. People can develop strategies to cope with surface UXO by interacting with it on their own terms, but this sort of choice may not be available where significant sub-surface contamination is suspected.

The nature of the contaminated environment

Sub-surface UXO is more likely to be found in soft ground. Soft ground also makes items less likely to detonate and therefore increases the proportion that remains unexploded.

Obstacles such as vegetation that need to be cleared before land can be used may also intensify UXO contamination and exacerbate land denial. The remains of damaged property may have a similar effect; debris may also contain significant amounts of metal which can make detector-led searching for UXO very difficult.

Both vegetation and debris reduce peoples' sense of control over their environment and make them less willing to use areas of land or to interact with UXO. Dense vegetation, like soft ground, also means that items of ordnance are more likely to remain unexploded.

Social and economic factors affecting risk-taking with UXO

The social forces that affect the way in which individuals and communities relate to UXO in their environment are complex and vary from culture to culture. Some people avoid using land through fear, while others interact with UXO in an intrusive way. What is clear from this research is that decisions to take risks with UXO are not only a balance between economics and fear, but are also conditioned by important social factors, including a sense of social responsibility.

Poverty

Among many poor communities, UXO and other military debris have value as a resource. UXO can provide access to cash within communities where this is rare. For those on the very margins of society, UXO can be the mainstay of their economic survival. This leads people to undertake high-risk activities that are a major cause of UXO accidents in many countries.

UXO provides a resource in two main ways: for the saleable value of the scrap metal and for the utility of the explosives. Metal can provide a source of cash, giving access to other products for subsistence communities living in the aftermath of conflict. Similarly, explosives can be sold or used for fishing and quarrying, which can produce cash income to supplement a family's subsistence activities.

Both practices may require very intrusive interaction with items of UXO. The most valuable scrap metal is usually copper, found in many types of ordnance. Fishing with explosives, or directly with ordnance, often involves dismantling and then re-fuzing the ordnance.

Gender

The data in this report show that men consistently comprise the great majority of UXO victims. Death and injury from accidental contact with UXO may be based on typical divisions of labour within communities – either in the type or location of work – and the likelihood of previous military experience.

Children

Children make up a significantly greater proportion of UXO victims than landmine victims and are more likely than adults to pick up items of UXO that they find without knowing what these items are. In many rural communities children are responsible for herding animals, a job which can take them over large areas of their local environment, and into unsupervised contact with UXO.

The size and shape of munitions may make them attractive to children. In Lao PDR and Cambodia, spherical bomblets of the US cluster bombs resemble balls that children might play with. The bright colours of certain munitions have been noted as interesting to children. Recently, there has been strong criticism of the use of BLU97 cluster submunitions, dropped on Afghanistan by the US Air Force. This sensitive and powerful submunition was found to be particularly problematic in Kosovo, with high failure rates; the bright yellow colour and small drogue parachutes of the submunitions made them especially interesting for children.

Cluster munitions

In recent years cluster bombs and their submunitions have come under increased scrutiny for having apparently higher failure rates than 'unitary' (single warhead) munitions. This, coupled with the large numbers in which individual submunitions can be used, causes serious UXO contamination.

Communities in all three countries studied for this report – Cambodia, Kosovo and Eritrea – have suffered from contamination by unexploded cluster submunitions. In one displaced persons camp in Eritrea, this research identified large amounts of unexploded BL755 cluster submunitions, manufactured in the UK by Hunting Engineering.

The use of cluster bombs is capable of producing both a high density of contamination and sub-surface contamination. Submunitions therefore consistently produce the more problematic forms of UXO contamination.

Recommendations

New international humanitarian law to minimise the legacy of future conflicts is urgently required. States Parties to the Convention on Conventional Weapons should move with the urgency this problem deserves to negotiate a new protocol on explosive remnants of war. But there must be a recognition that the only truly effective way to protect civilian populations is by eradicating UXO, both in the immediate aftermath of conflict and longer term.

The key elements of a new protocol should therefore include:

1. The users of explosive munitions, including cluster submunitions, should be responsible for the clearance of unexploded ordnance, or for providing financial assistance sufficient to ensure its clearance, without delay, after active hostilities have ceased. Where necessary this should be implemented by appropriate humanitarian mine action NGOs under the auspices of the UN, and in every case to recognised International Mine Action Standards (IMAS). Agreements to terminate hostilities, peace negotiations and other relevant military technical agreements should include provisions allocating responsibility, standards and procedures for signing off land as cleared.
2. Technical information to facilitate clearance should be provided to the UN and clearance organisations immediately after use. This should include accurate data on types of ordnance used, geographical locations and render safe procedures.
3. The users of weapons likely to have a long-term impact should provide appropriate information and warnings, such as awareness education, to civilians both during and after conflict.
4. Given the particular problems caused by cluster submunitions, specific measures are also necessary to require military commanders and responsible politicians to minimise the density and size of post-conflict cluster munition contamination by considering the environment within which potential targets are located. The International Committee of the Red Cross have proposed a prohibition on the use of cluster munitions in or near concentrations of civilians.
5. The users of explosive ordnance should consider their responsibility towards the survivors of UXO accidents. As with landmines, people who have been injured or disabled by other explosive remnants of war will require at least some of the following: emergency first aid, medical care including surgery, physical aids or prosthetics, psychiatric support, and assistance for long-term social and economic rehabilitation.

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