

CLEARING THE AREA

David Leigh reports on the importance of rendering safe the explosive remnants of war

De-mining and explosive ordnance disposal (EOD) have been around for about the last 100 years. Historically it was the preserve of the military to clear up the battlefields where armies met and fought out their encounters and it is estimated that as of 2014 some 59.5 million people were forcibly displaced owing to conflict, and 90 percent of current war casualties are civilians, the vast majority of which are women and children. Prolonged conflict keeps countries poor and promotes the cycle of despair. Conflict termination will be played out and stabilisation and reconstruction will be required to provide hope for the future. A failure to meet this challenge will mean these disasters turn into cataclysms and spread like a virulent epidemic. It represents a clear and present danger to our way of life and the security of our democratic

THERE NEEDS TO BE A PARADIGM SHIFT IN ADDRESSING ERW AND RECOVERY OPERATIONS

societies. It is time to examine whether current de-mining and EOD efforts can be brought up to date and made fit for purpose as the basis for national re-construction.

General Haftar is poised to 'invade' the Libyan capital Tripoli, which could spark a major humanitarian crisis. The final battle of Baghouz in Syria has just been concluded; the region's cities, towns and villages are destroyed and millions of people are either internally displaced or have fled the country to move to safety and exist in a state of utter squalor. Syria is a humanitarian disaster on an epic scale. The situation in Yemen is being described as the worst humanitarian crisis of our time. The UN is warning that 13 million civilians face starvation in what it says could become "the worst famine in the world in 100 years".

Explosive Remnants of War (ERW) are the detritus which litter the ground as a result of battle. It embraces mortar and artillery shells, land mines, rockets and missiles, sub munitions and discarded stockpiles: anything with an explosive content. It is the stuff that didn't go off. It is casually spread across the land among

the population, in their homes, roads, fields and factories. It disrupts all life, and places an intolerable burden on the ability to reconstruct society, post war, with long-term social, economic and environmental costs. It presents numerous challenges to the state: national infrastructure, energy, communications, transport and medical systems destroyed. Agricultural land rendered unusable; large-scale movement of internally displaced persons, which leads to refugee flows across borders.

LONG LASTING EFFECTS

Some 84 countries and territories are beset with the problems caused by ERW and Europe is still clearing up 100 years after the end of WW1. Laos has lost over 11,000 people killed or injured, since 1975. Long-term clearance operations are going on in SE Asia post the Vietnam War, which ended 44 years ago. Libya has had 70 years of discarded explosive ordnance scattered throughout from 1940 to the present day. Large areas of agricultural land in the littoral are still infested with ERW depriving it of valuable agricultural produce. 90,000,000 loaves of bread not made every year, the loss of a ready supply of food, not to mention the trade in the commodity, leading to general commercial prosperity. Central Africa has endured decades of conflict, and it is still going on.

Various estimates put the cost of clearing a mine between \$300 and \$1,000. The cost of removing all existing mines about \$50 to \$100 billion. The aggregate economic and financial cost of conflict in 2014 was estimated to be \$14.3 billion, or 13.4 percent of the global economy.

There are two principal elements at the core of the clearance operations, location of ERW and its disposal. Traditionally ERW clearance operations are principally conducted by the military and once they have departed the scene by non-government organisations (NGOs) using highly trained operators who are expensive to deploy and maintain. Furthermore traditional methods, mainly explosive in nature, present their own challenges. The critical problem of using explosives is that they are an attractive commodity to terrorists or insurgents. National Authorities as well as the international community, through the UN, ban the use of explosives in some areas because of this threat. A brake is put on the reconstruction phase of operations – vital if normality is to be restored quickly. This exacerbates the problems identified earlier. It



An EOD specialist digs out an IED from a road used by the US military in Iraq

becomes a self-fulfilling downward spiral in to despair, despondency, disaffection and disruption.

Any strategy demands an end state that will allow communities and states to stabilise rapidly to allow them 'the freedom from' and freedom to'. It requires a coordinated approach by all parties, national and international, military and civilian, the private sector and donors. ERW clearance operations should be at the core of this, without it there can be no reconstruction. Without reconstruction there's no society.

If these challenges are not dealt with quickly they become a source of frustration and disillusionment to the people against the national authorities. It allows alternative voices to foment discontent and trouble, which will magnify the problems.

If the international community is to address this problem there needs to be a paradigm shift in addressing ERW in relation to stability and recovery operations. It is necessary to examine whether there isn't an easier, quicker, cheaper and safer way to clear ERW.

What if it was possible to deploy a system that didn't require any explosive parts, was easy to set up and presented a reduced risk to the operator that could not be weaponised and so was of no value to insurgents?

In 2015 British inventor Ed Pennington-Ridge was asked by the UN Mine Action Centre for Afghanistan to devise a system that was low cost and contained no explosives so that it reduced the risk to local de-mining teams. Ed realised that the development of energetic systems with an absence of UN hazard numbers had not received much research attention and it took him five years to come up with a device he called TJET. The TJET family of self-fill devices meets these criteria and costs from \$18 to \$50.

NO JOB TOO LARGE

TJET is the name of a family of self-fill devices designed to address large and small munitions. TJET500 can deal with any large ordnance and the TJET will deal with anything up to RPG7, TJET Mini with AP mines and small potential IEDs.

They contain no explosives and don't use any explosive accoutrements such as detonators or detonating cord. It does not, in itself, present a security risk to its operators or to the authorities as it cannot be weaponised. It has no value to terrorists or insurgents. It is entirely inert until it is constructed. It can be shipped at a far cheaper cost than explosive

UN Class 1 goods. It does not require highly trained operators to handle. It typically takes half a day to train someone to use a TJET and takes five minutes to assemble. It is shipped with all its component parts ready to assemble. It is made out of a cardboard tube, a clay nozzle, two bags of propellant powders – which are mixed together and loaded into the tube – and a crocodile clip with a bridge-wire and initiating powder to ignite it. The TJET is placed about 2cm from the target and once electrically ignited (a car battery will do), burns at approximately 2,200°C. It will penetrate through 22mm of steel within 12 seconds and low order the target. TJET and TJET Mini will burn at a lower temperature, but sufficient

LIBYA HAS HAD 70 YEARS OF DISCARDED EXPLOSIVE ORDNANCE FROM 1940 TO THE CURRENT DAY

to attack RPG7 and landmines. It does not require any special handling or storage facilities and is not constrained by UN embargos.

Within the civil military affairs sphere of operations TJET could act as a force multiplier. Engineer EOD Training Teams, UNMAS or NGOs such as The HALO Trust, May Day Rescue and MAG can provide rapid support to communities to conduct local operations (after training), safe in the knowledge that TJET cannot be weaponised and so be used against them. Local village or community teams could be set up, organised and trained, then left with a stockpile

of TJets and an aide memoire on how to deploy them with a list of dos and don'ts, safety distances and so on. A reporting system could be introduced so resupply could be timely. There could even be scope to make payment possible for building the devices and for every munition destroyed, it could be in the form of agricultural tools, bags of cement or whatever, but a vital incentive to the community. It could enable areas contaminated by ERW to be cleared rapidly allowing agriculture to be restarted quickly and routes to be cleared for the populace to move around safely. TJET could be an empowering tool to help communities recover and progress. Progress engenders confidence in the future

RECOVERY TIME

Each area will respond to different incentives. The heart of this process is to identify these and enable communities to be part of the recovery process. Whatever the incentives are, they need to be introduced at the same time as the clearance operations are taking place so progress is seamless and visible. Led by the UN, perhaps, de-mining NGOs could adopt a more multi-disciplinary approach to achieve this synergistic effect.

TJET has been deployed in significant numbers in Somalia, Syria and elsewhere around the world. Indeed the Syrian Civil Defence has to date deployed over 7,500 units destroying a wide variety of munitions.

It is not the whole solution, it is one golf club in the bag, but it radically reduces the cost of EOD for ERW, is simple, inexpensive and can transform the landscape by a more rapid means of rendering safe ERW. In doing so it enables reconstruction forces to make a greater and faster impression on the population, which increases the chances of recovery back to a functioning society ●

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The simplicity of a TJET 500 in action in Syria

