Looming struggles over technology for border control

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Abstract

New technologies under development, capable of inflicting pain on masses of people, could be used for border control against asylum seekers. Implementation might be rationalized by the threat of mass migration due to climate change, nuclear disaster or exaggerated fears of refugees created by governments. We focus on taser anti-personnel mines, suggesting both

technological countermeasures and ways of making the use of such technology politically counterproductive. We also outline several other types of 'non-lethal' technology that could be used for border control and raise human rights concerns: high-powered microwaves; armed robots; wireless tasers; acoustic devices/vortex rings; ionizing and pulsed energy lasers; chemical calmatives, convulsants, bioregulators and malodurants. Whether all these possible border technologies will be implemented is a matter for speculation, but their serious human rights implications warrant advance scrutiny.

1. Introduction

There are millions of refugees in the world, many of them fleeing war and persecution. Although most of these people have found asylum - sometimes only temporary - elsewhere in their own countries or in nearby countries, the refugee 'problem' has caused the governments of many rich countries to develop ever more drastic measures to prevent unauthorized entry. At the same time they have mobilized public opinion against refugees.

Corporate globalization is breaking down traditional societies, opening economies to foreign investment. But the free flow of capital is not matched by an equivalent free flow of labour. Global mass media present unrealistic visions of western affluence while governments tighten entry requirements.

As refugees have been demonized by western governments and mass media, supporters of human rights have been put on the defensive. Yet things could become much worse.

A new era of sub-state warfare emerged after 11 September 2001, in which all refugees are viewed as suspect and new measures are considered to hold refugees outside of the borders of rich countries whilst their applications are processed (Statewatch 2003), or to biometrically track 'asylum seekers' once they are inside their chosen state of refuge.

According to Article 33 of the 1951 Geneva Refugee Convention, 'No Contracting State shall expel or return ("refouler") a refugee in any manner whatsoever to the frontiers of territories where his life or freedom would be threatened on account of his race, religion, nationality, membership of a particular social group or political opinion.' However, within Europe, huge 'Eurodac' databases have been set up to fingerprint every refugee to use this convention so that attempts to enter one EU country are prevented when another EU country previously refused

permission (SEMDOC 2002). Rapid advances in computation technologies using eye and face recognition will enable such tracking to become algorithmic and 'official non-residents' could be effectively barcoded and electronically branded when passing through external and internal gateways.

2. A New State Security Context

Such migrations are not happening in a vacuum. Affluent countries are creating advanced weapons technologies that are used in wars frequently leading to the displacement of civilians. Energy-intensive affluence is contributing to climate change that is already being seen in security terms because of its potential to rapidly generate huge numbers of refugees. Human-induced climate change could lead to sea level rises of several metres. Most of the world's key centres of population are on seaboards and highly vulnerable to the negative impacts of flooding.

From 1995, the EU has conceptualized the securitizing of the environment whilst lacking any influence to strategically integrate member states' military forces. A European Parliament resolution in 1999 noted that 'the number of "environmental refugees" now exceeds the number of "traditional refugees" (25 million compared with 22 million)' (EU 1999: 93). Analysts such as Vogler (2002) have noted that whilst the EU has stopped short of characterizing refugees as a security threat, it has perceived the flow of refugees as putting 'direct pressure on EU immigration and justice policies.'

Advisors to the US military have been more forthright. A secret report prepared for the Pentagon in 2003 and obtained by the media warns of catastrophic climate change leading to future wars being fought over the issue of survival rather than religion, ideology or national honour (Schwartz and Randall 2003). The report predicts that rich areas such as the US and Europe would become virtual fortresses to prevent millions of migrants from entering after being forced from land drowned by sea level rise or no longer able to grow crops, with more than 400 million people in sub-tropical regions at risk. They predict massive numbers of migrants arriving at Southern European shores from hard-hit Africa and mega-droughts affecting the world's major bread baskets, including America's midwest, where strong winds cause soil loss. Different regions would suffer disproportionately; for example, China's huge population makes it especially vulnerable and Bangladesh is predicted to become virtually uninhabitable because of rising sea levels.

Another source of mass human flows is political crisis or disaster. The explosion of just a single nuclear weapon in a city -

for example in the Middle East or South Asia - could trigger an avalanche of refugees fleeing the actual explosion, fallout or the risk of future attacks. A serious accident at a nuclear power plant could have similar consequences. Such possibilities could lead some states to seal their borders and to deploy technologies to prevent crossings by civilians.

We do not make predictions but rather suggest that there are several contingencies - climate change, war, terrorist attack, political emergency - that could lead large numbers of people to flee their homes and for states to seek to seal their borders against masses of people seeking asylum. Furthermore, even without a massive increase in human migration, it is possible for governments to create fears about such an occurrence that could be used to politically justify border policing. In other words, the refugee 'threat' is socially constructed: there doesn't need to be a real issue for technology to be deployed (Pickering 2004). Furthermore, the very deployment of such measures creates an assumption that there is a security crisis and helps to legitimate further developments.

3. Reframing Human Displacement Strategies and Options

Schwartz and Randall (2003) concede that it may already be too late to prevent a disaster that becomes a unique national security threat because there is no obvious enemy to attack. However, that has not stopped US military planners treating the threat as deserving of a technological treatment.

For several decades, militaries have been pouring funds into developing so-called non-lethal weapons, such as plastic bullets, electroshock batons and pepper spray. Some of these have already been adopted by police, military and state security forces. In addition to physical equipment, the category of non-lethal weapons includes techniques of human tracking, area denial, and advanced techniques of intimidation and interrogation, such as sensory deprivation - so-called 'torture-lite'. These tools are already being used on an everyday basis to quash dissent and to restrict access (Omega 2000). Another generation of sub-lethal incapacitating weaponry lies in the wings waiting new applications. In conference proceedings of specialist security seminars, refugee issues are reframed from a matter of humanitarian assistance into a new technopolitics of exclusion. (For detailed discussions of advances in so-called non-lethal weaponry and possible future capabilities and options, see the Janes seminars on non-lethal weapons and the non-lethal weapons symposia at Ettlingen, Germany hosted by Fraunhofer ICT.)

The intersection of the growing refugee 'problem' and futuristic techniques of technological control gives rise to some frightening possibilities in the next decade or two. New technologies give the capacity to inflict pain on whole groups of people. For example, in addition to electroshock batons that are used against individuals, weapons are being developed by governments and corporations to incapacitate entire crowds, based on chemical, biological, neurological and directed-energy mechanisms. Such weapons have been designed with mass incapacitation in mind and could have a tactical role when used for border protection against refugees, protesters at rallies, and any massed assembly. Some of these are aimed at area denial and use a targeting method that is both indiscriminate and victim-activated.

Our aim here is to explain some of the new technologies for social control and to give ideas about how they might be opposed. Because few of these technologies have been implemented, with some scarcely past the drawing board, our assessments are inevitably preliminary and speculative. Our aim here is not to predict the future but rather to warn about current trends and to suggest ways of carrying out technical and social analyses that can help those opposed to technological assault. We also want to draw attention to the ethics of some of the possible countermeasures to such technologies, when attempting to advance social justice in a time of terror.

4. Arsenals and Scenarios

The term 'non-lethal weapon' is often a misnomer, because people can be killed as well as permanently disabled by these weapons. This can occur when weapons are used contrary to specifications, such as plastic bullets fired at close range, or when the target is vulnerable, such as electroshock used against a person with a weak heart. Sometimes 'less-lethal weapon' or 'sub-lethal weapon' is used to indicate the ambiguity. However, because of their nature, many of these weapons can be deliberately abused to inflict torture or force compliance via pain (Amnesty 2003). Many of the technologies being developed for area denial or exclusion purposes have never been subjected to independent medical evaluation. It is worth mentioning some of the varieties of weapons to illustrate the medical uncertainties surrounding their alleged harmlessness (Wright 2002).

There are a number of new mechanisms for such weapons currently being explored, including taser anti-personnel mines; high-powered microwaves; armed robots; wireless tasers; acoustic devices/vortex rings; ionizing and pulsed energy lasers; chemical calmatives, convulsants, bioregulators and malodurants.

Some of this technology is so alien that the best way to imagine how it will be used is via imaginative devices such as science fiction stories or possible-use scenarios. In the future, science fiction and Hollywood can probably provide some of the most powerful warnings about the need for adequate social impact or technology assessment of such devices.

With a much more modest budget it is more appropriate for us to provide illustrative technological scenarios. We use taser landmines as our primary example, giving an overview of the technology and its likely applications and then suggesting some possible technical countermeasures, namely ways that targets of the weapons might avoid or neutralize them. We then suggest some more generally applicable political countermeasures, namely ways for targets or opponents of the weapons to challenge taser landmines, at the point of use or earlier during production, sale or implementation. We are also mindful of the potential future role of support networks that may be better equipped than the immediate targets, lending their energy and external resources to providing bridges out from areas otherwise technologically denied. In a later section we introduce a number of other scenarios and possible technical countermeasures.

5. Taser Landmines

A taser is an electroshock weapon. It delivers a high voltage, typically 50,000 volts, to the target, resulting in excruciating pain and a shutdown of major muscle groups, causing physical collapse. A typical weapon used in policing fires two darts at the target, with trailing wires. Once an electrical connection is made, the voltage is turned on, disabling the target even through clothing.

   The taser is supposed to be non-lethal, causing no permanent damage, but there have been reported cases of deaths and miscarriages linked to taser use, though causation has been contested by police.   A recent report by Amnesty International alleges that there have been over 70 deaths attributable to taser use in the US and Canada (Amnesty 2004). What is undoubted is the extreme pain caused by tasers. When a group of volunteers experienced the effect of a taser, only one was willing to accept exposure for the full five seconds before the voltage was automatically cut off, and not a single one volunteered for a second shock (Rappert 2003).

   The idea of the taser landmine is to arm a landmine not with an explosive but with a taser. A person triggering the mine would be hit by the taser darts and immobilized. The taser would give regular shocks over an extended period, up to an hour.

A field of taser landmines could serve as a form of non-lethal border protection. An area would be mined; a few guards would be available to arrest or release victims of the mines.

Given the high level of pain caused by even a few seconds of taser shocks, the consequences of many minutes of shock are truly horrific, and would likely result in post-traumatic stress disorder if not worse.

5.1 Technological Countermeasures

As with any minefield, an obvious countermeasure is avoidance, namely getting through the field without triggering any mines. But the risks are so great that this seems unwise. Another option is triggering mines by tossing objects into the field, by using long non-conducting probes (such as wooden poles), or by sending an automatic vehicle into the area. Another approach is protection, for example a large shield surrounding the body, separated by insulation. Riding in a car would easily provide protection - but not in difficult terrain. It is also possible to imagine electromagnetic countermeasures designed to disrupt taser electronics. These are likely to be far too advanced for most refugees to contemplate initially. But there will be a learning curve as refugees find out about the technology and try out crude measures to resist or avoid it. Later, sympathetic NGOs might be able to provide both information and practical assistance in creating mechanisms to disable the mines or to drive vehicles into the mined areas that can produce safe bridges once all the existing ordnance has been triggered. Testing might indicate for example that devices as simple as a pulsed water pistol are sufficient to trigger the device; modern toys have quite high ranges and include substantial reservoirs. Or more simply, a large sports utility vehicle (SUV) or landrover could be driven from the other side and spray paint used on the ground to mark a safe route. Even relatively simple devices such as a lawn mower with fixed wheels could be adapted and let loose if the terrain was smooth. Another option is the use of animals, such as sheep or goats, that could be herded through a minefield to create a safe path for humans, though at the cost of hurting the animals.

6. Political Countermeasures

One of the attractions of non-lethal weapons, from the point of view of their promoters, is that they have a more benign appearance and are thus less likely to cause concern than old-fashioned lethal weapons such as guns. If refugees were shot down in cold blood at borders, this could cause outrage, but if they were deterred by chemical or electrical techniques, outrage might be reduced.

Torture is almost always carried out in secret, because it is widely seen as reprehensible. However, torture carried out using sensory deprivation may be presented as not quite so bad as a brutal beating, though it can be just as damaging. We therefore are interested in ways that defenders of human rights can ensure that appropriate outrage results from illegal use of non-lethal weapons. To provide a framework for analysing political countermeasures, we use the theory of backfire dynamics (Jansen and Martin 2003, 2004; Martin 2004, 2005; Martin and Wright 2003).

If an action is perceived as unjust and information about it is communicated to receptive audiences, it has the capacity to backfire against those held responsible. For example, a cold-blooded massacre of peaceful protesters can backfire against the killers or the government held responsible (Sharp 1973). Prominent examples include the 1960 Sharpeville massacre in South Africa, which greatly stimulated international opposition to apartheid, and the 1991 Dili massacre in East Timor, which led to a huge increase in international support for East Timorese independence.

Attackers have several ways to inhibit this backfire process: (1) cover-up; (2) devaluation of the targets; (3) reinterpretation of what is happening; (4) use of official processes to give the appearance of justice; and (5) intimidation and bribery.

These five methods are commonly used when asylum seekers are held in detention camps, in order to prevent outrage from this inhumane treatment. For example, in Australia (Callaghan and Martin 2004), (1) many detention camps are far from population centres and kept off limits to the media, to prevent the general public knowing the damage caused to inmates. (2) Refugees are demonized as threats to the integrity of the nation, as self-seeking, as inferior, and as terrorists. (3) Use of detention camps is said to be about border protection, not about denial of human rights. (4) Appeal procedures for refugees give the appearance of justice and thereby reduce immediate outrage, but in practice, due to cost, slowness and procedural complexity, perpetuate the detention process. (5) Detention itself is a form of intimidation. Protest against detention can be met by deportation or by bureaucratic reprisals such as denial of family reunions.

To oppose injustice, each of these five methods needs to be countered. (1) The obvious way to counter cover-up is through exposure, for example through films of conditions in detention camps. (2) The best way to counter devaluation is to humanize refugees, for example through personal profiles of individuals. (3) To counter official defences of refugee policy, the significance of human rights needs to be continually

emphasized. (4) For opponents of refugee policies, it is tempting to pursue legal or procedural paths such as court challenges to the treatment of individual refugees. The danger is that this may chew up large amounts of money and energy and take a very long time while policies create ever more victims. Procedural routes, if pursued, need to be combined with publicity in order to maximize public outrage. (5) There are two main ways to counter intimidation. One is to refuse to be intimidated. The other is to expose the intimidation itself. This applies not just to refugees but also to others. For example, journalists and editors can go ahead and publish stories despite legal threats, and expose the threats in order to discredit them.

International solidarity movements are also important in reminding perpetrators of human rights violations that they can and will be held accountable for their actions. Persistence is crucial though often difficult. In 2004, something occurred that previously would have hardly seemed believable: 27,000 Chilean victims of torture during the dirty wars from 1973-1992 (under the internationally supported Pinochet regime) were granted lifetime pensions (Gallardo 2004).

To illustrate how the backfire approach can be used, we examine the scenario of taser landmines, looking in turn at each of the five methods of amplifying outrage.

(1) The horrifying consequences of taser landmines need to be exposed, if possible well in advance by explaining the human effects of long-term exposure to tasers. Should an actual taser minefield be constructed, the visual effect is not likely to be striking: photos would not be dramatic, even of a person trapped by a taser. More useful would be confidential reports of the effects of long-term taser exposure or personal testimony of these effects.

(2) Before venturing into a field of taser landmines, it would be useful to carry out personal interviews with refugees, combined with photos. With computers and digital cameras, this could be carried out on the spot and communicated to wider audiences. This would bring refugees to life as 'real people' rather than faceless intruders.

(3) Proponents will paint taser landmines as a legitimate, non-lethal technique to prevent unauthorized border crossings. Opponents need to present counterarguments, including the extremely damaging effects of long-term exposure to tasers, as well as more general arguments about human rights.

(4) Legal or procedural paths, such as seeking a legal ban on the technology or on sales to particular regimes, can be useful especially if used as a tool to create awareness and concern. It

would be unwise to rely entirely on formal channels, because laws and regulations are too easily delayed, eviscerated, circumvented or overturned. For example, the taser mine itself is cynically designed to be compliant with the Ottawa Treaty against landmines. Future campaigners need to continue to examine the way these mines are actually used, because they may actually violate the treaty once deployed.

(5) Those seeking to expose the inhumane nature of the mines, by collecting and publishing information, need to stand up to threats and legal actions and not succumb to the temptation of accepting funding from organizations that expect recipients not to rock the boat.

It is important to remember that backfire only occurs when there is a perceived injustice, often linked to unfairness, disproportionality or norm violation. When peaceful protesters are violently attacked, this is commonly perceived as unjust because the protesters did nothing to deserve the severity of the attack. But if even a few protesters fight back, this can change the situation to one perceived as a confrontation with violence on both sides, and for many observers outrage is likely to be reduced even though there is still a disproportionality in the use of violence.

Similarly, if refugees are seen as victims of a brutal technology - taser landmines in this case - then they are likely to be viewed sympathetically. But if the refugees or their supporters are seen as being aggressive, for example by blowing up landmines, then some of this sympathy may be lost. Therefore, in looking at technological countermeasures, it is important to keep in mind the image presented to observers. Nonthreatening, defensive methods are likely to be viewed more favourably than violent aggressive ones.

7. Other Area Denial Scenarios

7.1 High-powered Microwaves

This device enables a pencil beam of microwave radiation to be focused on a human body at some distance. The result is near instant pain that can only be alleviated by moving out of the beam's path. Such weapons pose all the hazards associated with microwave radiation, with the eyes being particularly vulnerable to a cooking effect. The pain induced is meant to make the dose self-limiting but much higher exposure would become likely if lethal force or barriers blocked off escape routes. The official line is that the devices are safe, though no official technical data has been released. A November 2004 conference at Bradford University on non-lethal weapons questioned the assumption of

safety. A participant observed that a natural response to intense eye pain is to shut the eyes - hence making targets effectively blind so that they could no longer navigate a safe way out. Another expert said as far as he knew there was no automatic cut-off on the device which would close it down once a human reached a disabling temperature. Such blind targets would microwave cook en masse. An effective challenge to the apologists for such weapons is to advocate transparency and legal accountability. We will need to establish ways to control or oppose such innovations or face the prospect of successive generations of refugees and activists being the guinea pigs for each successive newcomer to the growing arsenal of unconventional disabling weapons.

At the time of writing this device is a mobile platform but it is not difficult to imagine such technologies being deployed at borders in roving beam fashion. It has been reported that these devices would be deployed in 2005, probably in Iraq (Lococo 2004).

The obvious countermeasures include either physical destruction of the device via some form of disruption, including rocks, or to mirror the beam back to source. The danger of such resistance is that it is likely to provoke the deployment of more lethal technology. A more defensive technology might be to set up a water curtain spray (if water is readily available), because this would dissipate the directed energy into the water as heat. For individuals, aluminium foil blankets and mirror sunglasses afford some protection and could be used on vehicles too. A high-tech form of countermeasure might be the use of 'microwave bridges' to redirect the radiation back to source. However whilst such techno-jiu-jitsu devices are appealing in principle, without the ability for proper field-testing they are likely to remain the domain of government-funded countermeasure programmes that are already investigating how to overcome such border control devices.

7.2 Armed Robots

Armed robots are algorithmic self-deciding intelligent mobile devices armed with either lethal or sub-lethal weapons and capable of operating as border patrol agents. What was once science fiction is now a reality. Robots bearing incapacitating technologies are now marketed as programmable sentinels of organized violence that will work without respite. The potential hazards are those associated with weapons operating without finer points of discrimination or being deliberately deployed in an abusive configuration especially when on automatic mode and hunting in packs.

Isaac Asimov's science fiction was predicated on rules that no robot should ever be programmed to harm a human being. That design criterion remains fictional: these devices have the potential to be a form of ruthless border patrol that can make rottweilers passé. Unlike rottweilers, such 'self-deciding vehicles' will not be able to be lured off with a juicy piece of steak. However, all such devices must be mobile and their patrol route governed by terrain. Like fictional Daleks, old robots could not go up stairs or negotiate steep hills or holes, so setting up suitable obstacles would enable robot-free bridges to be temporarily secured. New robots, such as the Foster-Miller armed military robots, planned for deployment in Iraq in 2005, can walk up stairs (Anon 2005). (Foster-Miller is a subsidiary of QinetiQ, a company in the Carlisle group, which is heavily involved in oil exploration.) Unlike humans, such robots generate neither letters of condolence to grieving parents nor are they ever likely to be court-martialled for killing an unarmed civilian.

To deal with armed robots, opponents can use tools to tip them over. Most such devices are vulnerable to fire: already the web provides instructions on using mixtures of petrol, soap flakes and polystyrene that would be sufficient to napalm them out of kilter but it is likely that other members of the robot gang will be pre-programmed to report such attacks and request reinforcements. Less violent approaches involving minimum equipment include netting to immobilize robots and black spray paint if a robot is dependent on electronic camera vision for orientation. However, aerial robots may be harder to resist, especially if they are designed to spray calmatives or project other paralysing and incapacitating systems on to crowds. As yet UAVs - unmanned aerial vehicles - are very expensive but that may change. In such circumstances, their Achilles heel is the telecommunications link, which could be targeted with a simple microwave weapon based on a car-battery powered device using a microwave oven and satellite dish.

7.3 Wireless Tasers

These devices work by spraying plasma from a water cannon device: in essence, conductive liquid spray allows electrical-energy-inducing equipment to transfer the shock to the crowd. This technology is being actively researched in Germany and Russia and depends on relatively calm conditions (Fortov et al. 2003; Meisterhans 2003). Countermeasures could be focussed at either diverting the stream of plasma or earthing the flow of electricity with a physical metal-covered barrier. If it was a static location then using a car-battery-powered set of fans might be sufficient to divert the flow off target. Physical pre-assembled foil-covered shields might be just as useful in cutting off the flow.

Alternatively, if any mains source is available, a counterblast could be attempted by rubber-gloved activists since the plasma will conduct power both ways and it seems unlikely that the device would be built to run on other than grid electricity. A more daring way of achieving this aim would be rocket powered hooks with metal lines used as marine life saving equipment but, if such devices are in short supply, other earthing devices using coiled wire might be attempted. Indeed, hundreds of commercially available helium-filled foil balloons might serve admirably or, if helium was unavailable, the more flammable natural gas could be used.

7.4 Acoustic Devices/Vortex Ring

Acoustic devices can cause disorientation by producing very loud noises. Infra-sound can be created using two ultrasound beams. Pyrotechnically generated sound rings can create either knock-down effects at a distance or carry other incapacitating agents. However, critics doubt the viability of some acoustic weapons, since permanent damage to the ear is possible. Vortex ring technology is still at the prototype stage but blunt trauma injuries are likely to be similar to those associated with water cannon (Deiming et al. 2001).

7.5 Ionizing and Pulsed Energy Lasers

Laser light in the UV spectrum can ionize the air sufficiently for it to conduct high voltage electricity, thus making possible directed energy weapons. Their hazards are essentially those associated with electroshocking a diverse population including susceptibility to stress-induced heart attacks, pacemaker failure and induction of post traumatic stress. A new variant has recently been reported from the US Joint Non Lethal Weapons Directorate, namely the pulsed energy projectile that is scheduled to hit the streets by 2006. It started life as the 'Pulsed Impulsive Kill Laser' but has been retuned to create a shock wave by vapourizing the first thing it hits (Hambling 2002, 2004). Its technical specifications have been well guarded but some superfluous injury and traumatic shock induction seem likely. At this stage, the most effective countermeasures revolve around challenging the inhumane nature of using a weapon whose physiological effects on a mixed audience cannot be known in advance.

7.6 Chemical Calmatives, Convulsants, Bio-regulators and Malodurants

A wide range of chemicals that create a paralyzing effect can be delivered to targets by existing mechanisms for delivering chemical or malodorous agents. Bioregulators would be targeted at interfering with body functions that maintain steady body

temperature, heart rate, breathing and heart rates, etc. However, one person's tranquillization is another's lethal dose. In field circumstances, it is impossible to guarantee a uniform effect. Further advances in molecular biology are being directed at specific receptor sites in the human brain that can induce fear and anxiety. These breakthroughs create capacities that no government has ever been shown to use responsibly. The developments pose a huge challenge to NGOs wishing to avoid an arms race in the life sciences (Dando and Nathanson 2004). Yet the strongest objection to their future development remains the fact that they are illegal in most plausible scenarios of future use; this offers a strong campaigning platform.

8. Conclusion

The introduction of border control using methods such as taser landmines, armed robots or high-powered microwaves is a frightful prospect, given the physical, emotional and social damage that would ensue. We hope that none of these scenarios is actually played out, but feel it necessary to explore the possibility in order to raise concern. We assume that refugees, activists and others will continue to face new technologies in the arsenals of states determined to go beyond the limits of morality and the law. The ethical question for activists during such times, as ever, is what choices should be made if we are to sustain a role as human rights defenders?

In outlining scenarios, we have mentioned some technological countermeasures. We also outlined political countermeasures to taser landmines, noting that similar political countermeasures would apply to the other scenarios. We know that some of these activities will in themselves invite legal and possibly police and military challenge. Our assessments are intended to stimulate thinking about possibilities rather than provide definitive answers.

The nightmare scenario is that such area denial technologies are imposed in a mechanistic manner that isolates large numbers of people desperately fleeing disaster and conflict. The dilemma then for those determined to engage in humanitarian action is what can and should be done to counter such technologies. Much depends on how much preparation time there is and what values are being defended. We believe that activists need to address the unpalatable truth of the emergence of technologies specifically designed to undermine current nonviolent strategies. Technological countermeasures are only part of the solution to human rights abuses due to border control technologies. The challenge is to design effective and humane countermeasures that do not invite a more violent response. We encourage others to replicate and innovate means of

technological and political resistance and maintain a focus on the central issues of human rights.

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