**TECHNO-POLITICS OF EXCLUSION**

Steve Wright & Tessie Humble\*, Leeds Beckett University

**1. INTRODUCTION**

If we are to adequately anticipate and accurately judge the likely trajectory of global responses to climate change, a working assumption should be that over the next fifty years, most political responses, will be neither just, nor sufficient.

Considerable work has now been achieved in mapping out relative vulnerability. (See, Scheffran et. al, 2012, parts V-VII) For several nations this may mean the end; others will be faced with substantial internal migration and for the most affected, a mass exodus to foreign shores, as people struggle to find continuity. All such scenarios remain contested and are part of the growing “securitization of climate change discourse.” (Ibid, part III)

This chapter assumes that preparations to meet these challenges will be wholly inadequate. States will be panicked into emergency measures and deep clamps on freedom of movement. Past analyses have treated such scenarios as environmental disasters. This chapter sees such scenarios being reframed as emergency planning options, which are already being re-structured into military driven national security/ crisis planning options.

What can we expect if climate change policy responses are handed over to the military at a time when continuity of energy, water and food supply chains, can no longer be guaranteed? The chapter presents evidence that many military organisations are now working on responses to climate change, from a state security rather than a human security perspective. What does this entail?

Essentially, two interrelated processes kick in: one informatics based; the other focussed on technologies for systematic physical exclusion of unauthorized citizens, based on a wide variety of emergent coercive capacities.

States already now have tough systems at borders to prevent anyone without documentation passing and these are becoming increasingly sophisticated with various biometric recognition, surveillance and tracking capabilities. Face recognition and vehicle tracking systems originally designed in response to the “war against terror,” can be rapidly re-orientated towards climate change refugees. Such people will not be officially designated as such since the general derogatory label of illegal immigrants will facilitate a legal exclusion response because climate change refugees have no legal status.

This chapter presents evidence of the security paradigm shift amongst major military powers to encompassing climate change as a major security threat. Similarly, the military, police, media entertainment, university security complex is already reframing its capability set towards new measures to ensure border security and zone exclusion. This new capability sets already include non-human algorithms and robotic elements for patrolling long borders. Indeed, a wide variety of sub-lethal weaponry has emerged which either can be fired directly at crowds by security personnel, or remotely operated by machine intelligence. But how probable are such deployments in a climate change context?

The substantive sections of the chapter explore the reconfiguration of the major manufactures of intelligent fencing systems; unmanned aerial vehicles (UAVs), robotic security and patrolling systems, as well as lethal and sub-lethal weapons technologies and doctrines, to meet the demands of these new markets. That is perhaps the core contribution of this chapter. It aims to analyse and reveal the level and extent of corporate collusion in building new exclusion systems as joint-market profit-making ventures, with a range of state clients. It will build on the picture of what we know already of who has built what and their partnerships and what models they are proposing for future crowd management, disaster control and perimeter protection, along critical conduits and borders.

The chapter ends with a discussion of some ethical dilemmas of how to respond to such technical fixing of the second order effects of climate change, namely:-

* to acquiesce which may be tantamount to collusion;
* to engage in research activism to reveal social and political consequences of existing fence systems like those recently erected in Libya and Bangladesh; or,
* To devise counter technologies which facilitate migration despite the official policies of exclusion.

Such uneasy ethics will be at the core of any future, intelligent NGO response to climate change induced mass migration. Do we build resilience into modern architectures and infrastructure or a fortress?: will we evolve a human or an inhumane menu of future solutions?; who is deciding such agendas for us and what drives them?

**2. REFRAMING CLIMATE CHANGE AS A SECURITY ISSUE**

Interest in climate change as a security issue is relatively new.[[1]](#footnote-1) Initially, the focus was on the prospects for violent conflict in the wake of climate change, and then the fuller security implications began to sink in. (UN,2009). It was only in the last decade that such issues were framed in national security contexts, initially in the U.S., when a report for the Pentagon on the potentially catastrophic impacts of *abrupt* climate changes, ( by Schwartz and Randall(2004), was leaked to the press.

Professor Dave Webb, of the Praxis Centre has critically analysed this suppressed Pentagon Report in terms of “Thinking the Worst”. (Webb,2007) in terms of both scientific veracity and political agendas. The terrifying scenarios presented include severe drought with 10% of Europe moving to a different country; storms destroying coastal barriers; border skirmishes in Bangladesh, India and China to direct confrontation between Saudi Arabia and China bringing US forces into the Gulf in direct confrontation – all before 2030.

In this future, deaths from famine, war and weather related disasters are predicted to run into millions. Webb questions the plausibility of this study and its impact: was it a call for saner more sustainable agreements on climate change, or a national security agenda? “*This sort or thinking and practice are very indicative of a situation in which human rights, international law and democratic processes are peremptorily sacrificed so that governments can continue to exercise complete control.* (ibid,p68)

Brausch & Scheffran(2012), have highlighted the different interests of policy makers with regard to national, international and human security perspectives. Thus, the US national security perspective was on whether or not the US military could continue to operate despite severe climate change impacts; the UN Security Council were primarily concerned about climate change as a threat multiplier, with the capacity to massively exacerbate existing conflicts and polarization (UN,2007) and human rights NGO’s were concerned whether the poorest communities, living in the most vulnerable regions could be protected from ensuing violent conflict and their overall lack of resilience. [[2]](#footnote-2)

Within Europe, this *securitizing* move found support but opponents said the matter should be considered not by the UN Security Council, (UNSC) but by Economic and Social Council (ECOSOC) and by the UN General Assembly. Taking it to the UNSC transformed the issue from a development and environmental issue to one of international security, invoking very different lenses for viewing and addressing what should be the most appropriate international response.

During 2007, the Intergovernmental Panel on Climate Change (IPCC) released its 4th report (IPCC,2007), which marked a turning point in both scientifically evidencing the reality of human induced climate change and identifying a wide range of specific vulnerabilities. By March 2008, the Council of the European Union released a paper on “Climate Change and International Security. (European Council, 2008) Subsequently, over 23 counties have designated climate change as a threat - and formally identified as policy, means to counteract in national security strategies.(Brzoska, M.,2012)

Paralleling this state re-scoping of climate change as a national security policy priority, was the post 9/11 policing and security revolution. This dimension of melding post 9/11 crisis planning, with the financing, management and policing of migration, has been relatively neglected. An honourable exception has been the cutting edge research work undertaken by Statewatch and TNI. New homeland security ideologies have reframed refugee policies within overarching counter-terror concerns.

Such policies saw the financing of new information management systems at borders and beyond. Ben Hayes’ work for TNI and Statewatch in identifying the move from migration controls, to social controls, has been definitive. He has documented the 1990’s process of creating immigration buffer zones in Central and Eastern Europe, initially to those countries wishing to join the EU. Such zones have subsequently grown according to Hayes, to encompass a neighbourhood that stretches from West Africa to Central Asia.(Hayes,2009). Instrumental in this process is the work of the specially created EU border management agency, FRONTEX, which he has documented in creating a ‘Southern Maritime frontier and a ‘host of joint police and naval missions to combat illegal immigration by sea.’(Ibid, p33)

Hayes explained to one of the authors, that the EU is exporting border security measures through technical support and the establishment of migration management systems, as well as creating a presence in third countries to intercept irregular migrations. Lavenex & Wichmann, explain that externalisation usually focuses on technical operational support and capacity building(Lavenex & Wichmann, 2009, p. 92). Intrinsic to advocating for the expansion and implementation of border security operational systems is the European Security Research Advisory Board (ESRAP) and Framework Programme for Research and Technological Development, currently at FP7 (Hayes, 2009). As a result of such measures, Guild argues “the borders of Europe have moved” (quoted in Geddes, 2003, p.13).

Powerful new exclusion zones have been facilitated by creating high tech barriers on the perimeters of the buffer zones, (see section 5, below) as well as co-ordinated information management networks using Automatic Fingerprint identification (AFIS) systems supplied by companies such as Motorola, integrated into the real time EU wide database known as EURODAC. (Ben Hayes in Chapter XX, further explores the evolution of international migration policies since the 1980’s – including contemporary plans for the warehousing of refugees in poor regions.

**3. PROBABILITIES, SCALE & EXTENT OF INDUCED MIGRATION[[3]](#footnote-3)**

In many senses the level, extent and speed of climate change and its real impact on levels of internal conflict and migration will remain contested. It doesn’t matter: security resource expenditure and prioritisation is neither based, nor ranked, on an objective calculus of relative risk.

To engage in a comprehensive study of the implications of border securitisation on climate-induced migration, the very notion of Climate Induced Migration (CIM) must first be considered. The difficulty of identifying climate-induced migrants is a core issue surrounding the ambiguity of the ‘climate-refugee’. Dr. Burridge, a Research Associate at the International Boundary Research Unit (IRBU) at Durham University, told one of the authors:

*“…a climate change refugee does not particularly exist, or cannot be identified directly as having migrated for this reason.” (Humble, 2011,Interview 3, Paragraph 10)*

Whilst CIM has been extensively theorised and forewarned (see: Myers, 2002; GHF, 2009; Renton, A. et al, 2009), Dr. Burridge explained that attributing climate change as a causality to migration is difficult, if not impossible, thus making identification of climate-induced migrants, problematic or even implausible.

The UK Foresight Report explains that incidents of ‘spiked’ weather events, such as storms, are likely to cause displacement, however, gradual environmental degradation, will cause migration (Foresight, 2011). This is likely to both create and be compounded by an array of other environmental, social, economic and political factors (Foresight, 2011). Such factors include water scarcity, salinization of irrigated lands, deforestation (Myers, cited in Castles, 2002, p.3), ineffective government responses, ethnic disputes and economic problems (Myers and Kent, cited in Castles, 2002, p.4), amongst others. Therefore this great difficulty of ‘disaggregated causality’ (Brown, 2008), presents a risk of making the climate-induced migrant an intangible figure, supporting Dr. Burridge’s argument. This raises the question of the plausibility of constructing legal, or other operational definitions, and/or frameworks for recognition and protection of the climate-induced migrant (Zetter, 2008) to support legitimate migration and ability to seek refuge

Dr Purkayastha and Dr. Scott informed one of the authors that the issue of CIM was essentially one of vulnerability and marginalisation that already exists as an integral part of society in many regions in the world. (Humble,2011 op. cit) Dr. Purkayastha, an expert on border security struggles in the Palestinian territories, explained:

“*Economic migration predates climate change effects. The climate change effects will only amplify what already exists on the ground – very large disparities without a hope of its redress.”* (Ibid, Interview 7, Paragraph 7)

Here, Purkayastha fundamentally attributes the root cause of migration that falls under CIM to severe economic inequalities and that climate change serves simply as an aggravating factor on such pre-existing stresses. Dr. Scott took this point further by arguing:

*“My honest feeling is that this whole discussion about climate change and migration is a red herring, that it’s a diversion and, that the core problem of this question is one of vulnerability and the, historical production of vulnerability and vulnerable populations [...] it would be the result of poverty, it would be the result of any host of policies that might account for impoverishment and the production of particular populations too, so to attribute migration to climate change I think misses that really key point*.” (Ibid, Interview 2, Paragraph 3)

Climate change is already creating a more hazardous effect in developing nations than the global north, because of the former’s generally warmer ‘starting temperatures’ (GHF, 2009) and their lower capacities to respond to risk (Baker, Ehrhart and Stone, 2008). With 40% of the world’s population living in socio-economic poverty (GHF, 2009) and having limited capacity for adaption or resilience (Baker, Ehrhart and Stone, 2008), their socio-economic vulnerability to climate change is accentuated. Therefore a strong relation can be drawn between pre-existing social or economic vulnerabilities and the extent that climate change effects communities’ survival capacity and need to migrate.

This discourse is already being reified, as migrations attributed to climate change are being increasingly reported (Brown, 2007). For example, the Internal Displacement Monitoring Centre claimed in 2011 and 2011, that 42 million people were displaced due to environmental factors in the Pacific and Asia alone.[[4]](#footnote-4) A critical and commonly held viewpoint on the discussion is that regardless of the different causalities involved, who will be affected, how many and when, global migration flows will definitely accelerate as the effects of climate change increase (see: Webb, 2007; Brauch, 2005).

**3.1 Migration as a Security Threat**

A recurring theme is the concept of migration being considered as a security threat. Maria Martin of Statewatch, who writes extensively on the legal and human rights aspects of migration, provides invaluable insight on this:

*“So this very notion of what is the border made for and what does the notion of security and protection mean, I guess that’s the core of it, because based on that you have for instance in Europe the development of the legal framework of the notion of cross border crime, it is crazy to see that everything that crosses the border is perceived as a potential threat. It could be a human threat.… There is a suspicion about everything. And the basis will be to track the threats and to prevent them from entering, whether that be at the fence or whatever location.”*(Ibid, Interview 5, Para 6)

Martin explained that state border security is based around how threats are understood and conceptualised, which she argues in Europe is increasingly focussed on ‘cross-border’ crime. Guild argues migration and security studies have become ‘subcategories’ of international relations (Guild, 2009). As the migrant becomes classified under state-defined security terms, the figure becomes alien and more easily regarded as a ‘problem’ or ‘threat’ (Guild, 2009) and as Bigo argues, becomes caught in a “continuum of insecurity” (Bigo, 2002, as quoted in Guild, 2009).

Underlining Martin’s argument, these notions of ‘suspect sub-categories’ enable us to understand why more and more people attempting to immigrate, may be blocked in the current geopolitical context. If all human traffic is viewed as a potential threat under a ‘guilty until proven otherwise’ attitude, the role of border security is to intercept all immigrants, regardless of their needs or intentions, allowing only those who can prove their wealth or innocence, to enter.

Dr. Burridge echoed Martin’s statements, arguing that migrants are clustered together with high risk social groups:

*“One of the most significant problems I see is the conflation of migrants and asylum seekers or refugees with that of ‘threats’, criminal, terrorist, or otherwise [...] Every few years or more frequently, immigration bills try to get put through by the government [...] So in Arizona there was, I have a blank on the name of the Bill, [SB 1070], it was essentially increasing the criminalisation of migrants from being present in the US..”(*Interview 3, Paragraph 9)

Here Dr. Burridge explained that migrants were not only considered as threats but were being portrayed as acting illegally. White argues similar sentiments, saying that immigrants are perceived as threats for varying reasons, most commonly through being portrayed as having “terrorist or criminal intentions” (White, 2011). Dr. Burridge exemplified this by arguing that laws are being implemented in the US, such as the SB 1070 legislation[[5]](#footnote-5), that essentially legalise treating all perceived migrants with the suspicion of acting illegally. This ultimately creates a reality where everyone that is associated with the notion of ‘migrant’- prior to or post border-crossing, asylum seeker, refugee or those simply believed to look like migrants, is being regarded as a threat that must be intercepted. (Martin and Wright, 2006)

Castles and Miller explain that international migration has become greatly politicised, arguing the migration-security nexus has materialised as a point of central importance for both national security and within global governance (Castles and Miller, 2009). Conclusive to Martin and Dr. Burridge’s arguments is the shift of migration from being understood as a historical aspect of human behaviour for social and survival needs, to that of the migrant being a threat of which the nation-state must secure itself against (Smith, 2007).

**3.2 The Numbers Game**

Jakobeit, C., & Methmann,C.,(2012): have done an excellent job of deconstructing the politics of the climate change induced-migrants numbers debate, which they rightly see has highly politicized. They argue that the issue is complex and there are different types of migration which might be permanent or temporary, over a long or short distance. Their analysis reflects on traditional creative adaptation and coping mechanisms for dealing with existing climate change variations, in places like West Africa, which use circular migration.

They examine the wide disparity of estimates in existing studies trying to quantify future numbers of climate refugees, which vary from 50 million (UNU-EHS,2005) to 250 million (Christian Aid, 2009). Mocking such estimates has become part of the climate-change deniers’ arsenal. But for the purposes of this chapter, they do not really matter. Manufactured perceptions are more vital to future securitization agendas than any scientific accounts. Future arrangements will be focussed on ‘illegal aliens’, ‘terrorist networks’ and ‘bogus asylum seekers.’ Why you want to cross borders is less important than proving you have the correct paperwork to avoid being jailed.

All modern states now have well-oiled systems of tackling illegal migration, particularly given that many such would-be migrants into Europe for example, are non-Christian. In these xenophobic times, Muslims are increasingly subject to enhanced attention, state security prejudice and paranoia, linking that religion with heightened security-risk status. Even though scientific communities may understand the need for sustainable solutions, the behaviour of security forces in on-going economic, political and military crises, have underlined just how far we are from achieving such governance.

Poverty, water, food and fuel scarcity are part of a system of global ‘structural violence’ (Pilisuk 2008). Very poor people will bear the brunt of the consequences of climate change and they may rightly accuse their political leadership of corruption and being unmoved by the peoples’ fate and suffering. The convergence of such perceptions can provoke a security crisis that will despatch thousands or even hundreds of thousands of people on to the streets, as in Egypt in January 2011.[[6]](#footnote-6)

Most future climate-induced conflicts are unlikely to be pure types but will consist of a complex amalgam, of causes and consequences. Serious work is now being accomplished to firmly establish causal correlations between various forms of climate change and the precipitation of internal conflict.[[7]](#footnote-7) One constant however, is the convergence of the crisis-policing technologies deployed and the corporate entities who will profit enormously from supplying them. (See sections 4 and 5 below)

**4.VARIETIES OF SECURITY CONTROL:TECHNO-FIXING POPULAR RESPONSE**

The border exclusion technologies, facing all migrants amongst many others include; concrete walls, sand walls, virtual walls, monitoring and sniper towers, cameras, land radars and wireless telecommunication, as well as infra-red surveillance, carbon dioxide probes, fingerprints and personal data identifying technology and storage networks, and the arms carried by border guards (Humble, 2011). According to Hayes, Europe is moving towards a ‘high-tech techno-security paradigm’ of border controls. This is being increasingly described as the ‘fortification’ of Europe (Geddes, 2003; Martin, 2012; Pécoud and Guchteneire, 2006), The report NeoConOpticon, argues that the EU is moving towards ‘full-spectrum dominance’ through the bolstering of both technological and physical surveillance systems and barricades (Hayes, 2009), designed to make its borders increasingly impermeable.

This information is in-line with the multitude of techniques and task-specific border management systems reported to be employed under the EU security agenda (see: Statewatch,2006; Hayes, 2009; Hobbing, 2010). Hobbing explains that Frontex, the security agency responsible for the management of the EU’s external borders and interception of irregular migrants, is critical to the EU’s Integrated Border Management (IBM) system (Hobbing, 2010). EuroSur, a surveillance system that covers land and maritime borders, has become an integral part of this, which seeks to achieve ‘full situational awareness’ of external borders (Hayes, 2009). Other operational systems include Rapid Border Intervention Teams (RABITs), employed to help member states in “exceptional and urgent situations”, such as mass influxes of irregular migrants (Hobbing, 2010) as well Eurodac databases, previously mentioned which now collect finger-prints of all migrants entering the EU (Martin and Wright, 2006).

We can anticipate that new enhanced border-control measures, will also be accompanied by advanced crowd control initiatives. There has already been massive funding for future security technology innovations, in the wake of 9/11. These can be rapidly redeployed for internal security use, just as we saw in the wake of the ‘Arab Spring.’ Variants of these riot technologies such as water cannon, kinetic energy weapons, irritant gases such as CN, CS, CR, and tactics using wedge formations, and riot shields were first evolved in former British colonies then further refined by the British Army and the RUC in Northern Ireland, in the Seventies. Since then new neuro-muscular incapacitation devices, such as the 50.000 volt Taser, have proliferated across Europe and beyond.[[8]](#footnote-8)

All these riot weapons essentially act as force multipliers enabling smaller groups of security personnel to control greater numbers of people. They can raise significant civil liberties and human rights issues when misused or deployed in conjunction with lethal weaponry.(See Omega Foundation, 2000. Appendix C)[[9]](#footnote-9)

**4. 1 New Control Ideologies and the Revolution in Military Affairs**

The emergence of new capacities to immobilize individuals and crowds using, weapons which have either pain induction, maim functions or paralysis effects, has not happened in a vacuum. Even before 9/11, the US Military in particular was re-orientating towards a different type of warfare where unconventional opponents would be operating within urban terrain amongst ordinary civilians.

New military doctrines emerged to justify this reframing as part of the so called ‘Revolution in Military Affairs’ (RMA) and the notions of so called “full spectrum dominance” contained in the United States Space Command (1997) document, Vision 2020. These doctrines incorporated new information and targeting tactics, as well as new weaponry designed to be used against both combatants and civilians.(Halpin et. al, 2006). The new weaponry was promoted by the likes of Col.John Alexander, who advocated the notion of a non-lethal set of alternatives for 21st century warfare,(Alexander, 1999). With Sci-Fi writers Janet and Chris Morris and Alvin and Heidi Toffler(1993), Alexander managed to persuade the US DoD to set up a new programme of work exploring this new form of warfare -The Joint Non-lethal Weapons Directorate (JNLWD), of which he became the first Director in 1996.[[10]](#footnote-10)

Post 9/11, the JNLWD, based at the Marine Corp HQ at Quantico, has become the engine of soliciting and approving new sub-lethal technologies, border protection and exclusion systems and directed energy, punishment at a distance weapons. Their official wish-list[[11]](#footnote-11) , leaked by anti-secrecy site, “Public Intelligence”[[12]](#footnote-12) includes:-

* lasers and heat beams designed to disperse crowds;
* nausea-inducing sound waves targeted at scuba divers;
* the Impulse Swimmer Gun, is described as being able to "suppress underwater swimmers and divers;
* system designed to move people through an area by emitting a "heat sensation" causing "involuntary movement".
* Electro-muscular pulses which "substantially increase" the time a hostile person can be incapacitated.
* A portable system which emits high-powered microwaves capable of stalling a car engine at a distance.
* An unmanned, airborne vessel equipped with a microwave-emitting device capable of preventing a ship's propulsion by causing "electrical system malfunction".

So called “Non-Lethal Weapons(NLW) technologies have subsequently globalised[[13]](#footnote-13) and form part of the new arsenals of military, police and special forces as their various roles and tactics converge. (Davison,2009) Their key role is to provide enhanced coercion without the public opprobrium that might accompany any state use of lethal force.. Amnesty International, has identified their deployment with many human rights violations including torture. (Amnesty International,2003 ) Increasingly such weapons are used in conjunction with other coercive tactics including small arms. (Omega Foundation, 2000)

**4.2 Sub-Lethal Public Order & Perimeter Control Weapons**

The proceedings of the regular European non-lethal weapons symposia in Ettlingen, Germany, provide one of the best show cases to learn about such weapons and the standard operating procedures advocated by their proponents.[[14]](#footnote-14)

Critics of such alleged “non-lethality” raise their potential for torture and mass human rights violation. Landmine Action was one of the first NGO’s to report on potential configurations of some of these weapons for mass exclusion and perimeter protection, as new weapons were researched for replacing antipersonnel land mines, in the wake of the Ottawa Treaty Ban.( Doucet, and Lloyd, 2001)

Some of these using direct energy sound like science fiction, (See Moore,2000, Hambling, 2002); but there has been a relentless search for technologies which can bridge the gap between ‘shout and shoot,’ over several hundred metres. The Raytheon pain-beam based on a millimetre wave device which heats up humans to over 130 degrees, has been championed by the JNLWD[[15]](#footnote-15) and prototypes fielded but without operational use yet because of perceived controversy. (Authur, and Wright, 2006). However, Raytheon has already advertised related devices like the Silent Guardian, which are based on notions of “tuneable lethality” but promoted as harmless.[[16]](#footnote-16)

Others showcased at Ettlingen like the ‘Taser Shockwave’ project 50,000 volt electrified darts over a zone of 5 metres or so, are now in production.[[17]](#footnote-17) Zone paralysis can be induced by a wide variety of mechanisms including laser and sound (Altmann, 2008 and Hambling, 2011). The Russian authorities in 2002 used anaesthetics as a counter-terror capture approach in the Moscow Theatre siege against Chechen rebels but over 130 people died. (Klotz et. al,2003). The British Medical Association has warned of the dangers of attempting to use drugs as weapons.(BMA, 2007)[[18]](#footnote-18) . Work is continuing on refining such so called incapacitants, including work by Czech anaesthetists to add an time-released antidote[[19]](#footnote-19) and the US military have already field tested micro membrane balls that release agents only when trod on, with an obvious potential for border control. The BMA itself has warned of the dangers of nightmare developments in targeting chemical and bioweapons by genotype – so called ethnic weapons. These remain distant but breakthroughs in synthetic biology, mapping the human genotype, work on the ‘human diversity project,’ have brought such prospects closer[[20]](#footnote-20). Brain modelling has allowed a firmer grasp of the prospect of a new generation of incapacitants targeting the brain’s own bio-regulators (controlling breathing, heart functions and levels of induced anxiety): dangerous breakthroughs which Bradford University’s Professor Malcolm Dando, has consistently warned about and indefatigably researched. (Dando,2001,Wheelis & Dando, 2005 )

Yet many states are now using more everyday “wide area” riot control agents such as CN, CS and OC to incapacitate large numbers, delivered from a bewildering array of devices including mortars, grenades and via special back packs and water cannon. (Crowley, 2013) During the Arab Spring, we saw significant misuse of such devices to punish protestors whilst ushering them into more lethal firepower. In enclosed spaces riot agents will kill but at the time of writing this has not stopped the Turkish authorities for example firing chemical irritants into tents or in one instance, into a crowded police van where all 68 detainees died of asphyxiation. Such misuse of sub-lethal weapons is illegal under international law but without adequate enforcement systems, that will not stop ruthless authorities from treating their citizens in terms described by sociologist Zygmunt Bauman, as disposable people. (Bauman, 2003).

Already, we see evidence of states treating whole groups as expendable during emergencies, e.g.,the urgent needs of black residents in New Orleans displaced by Hurricane Katrina, were afforded less priority that public order policing. “*An already divided city was turned into a battleground between gated green zones and raging red zones.”*(Klein, 2007) In 2005, Morocco flew out planeloads of refugees from Senegal and dumped them in a minefield, after they attempted to reach Spanish enclaves by storming razor wire fences.[[21]](#footnote-21) More recently Australia has said it won’t take asylum seekers arriving by boat but will instead redirect them to Papua New Guinea.[[22]](#footnote-22) Such countries will shirk their ‘responsibility to protect’ unless public pressure intensifies – but immigration and asylum are now such “loaded” terms, the danger is for tipping points to go the other way towards supporting policies of exclusion. The relentless pace of innovation in new technologies of political control will see many security companies cashing in on climate change, as the capacity for large scale people containment and dissuasion increases.

In these contexts, it is vital that NGO’s follow initiatives such as Bradford’s Non-Lethal Weapon Project (Davison, 2009) (which examines the *state of the art);* Amnesty International, (whose (2003, & 2002) work on the *Pain merchants* and *Terror Trade Times*, which mapped out corporate collusion by security technology providers in arming the torturers); and the work of experts assembled by Maslen (under the Geneva Academy in 2010 to examine the technical, ethical and legal dimensions of these new control capacities), evaluating their impacts within the frameworks of international Humanitarian Law.[[23]](#footnote-23)

Such technical and legal contexts will become ever more important in challenging future vertical and horizontal proliferation of these systems, because any re-orientation of this security control capacity towards technically fixing the ‘problem’ of climate-induced migration, will require neither new policy, nor new legislation. Anyone crossing borders because of climate change; will increasingly find themself facing the hi-tech border fences described in the next section. Others will end up in long term refugee camps at the border, or if and when these overflow, in massed crowds rioting because of failed food, water, energy, health systems. If they become embroiled in associated public order conflicts; they have no special legal status: except as a potentially illegal migrant or a looter. The exodus of refugees from Syria, at the time of writing, gives a stark snapshot of scale – 2 million people leaving the country (half of which are children) and 5 million internally displaced. How would such numbers be handled if repeated across many continents, at the same time?

**5. BUILDING ACTIVE EXCLUSION ZONES: THE ROLE, FUNCTION AND ACTIVITIES OF CORPORATE PRIMES?**

Over the last twenty years or so, we have seen an acceleration of the pace of states’ building hi-tech boundary fences at critical borders. So much so, that the politics of exclusion, now form a backdrop to contemporary culture. In September 2013, The Guardian asks ‘Are you hemmed in by a fence or a separation wall?[[24]](#footnote-24)’ Hollywood explores the dispossessed being left in an inhospitable sprawl whilst the elite get to enjoy the bliss of extra-terrestrial *Elysium.*

The reality is a more relentless emergence of gated elite communities now being explored by urban geographers such as Stephen Graham at Newcastle University. Graham identifies the emergence of a much -more brutalized militarized urban policing to enforce apartheid scale inequalities in places like the occupied Territories of Palestine. What has already emerged according to Graham, is an ideology of a militarized urban battle-space.(Graham,2009, 2010). The requirements of policing this space are serviced by a tiny number of multinational military conglomerates or “primes” who see an extraordinarily lucrative market opportunity for diversification into security walls and weaponry.

****

****





|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Colour Code** | **Map No.** | **Stage of Construction** | **Source** | **Constructed Pre or post-9/11** |

**Table 1: Key for Maps 1 and 2 (***Source:Humble, T. (2011)* |
| **Green** - robust maritime security e.g. multi-dimensional technologies and surveillance |
| Australia - Australasia | 1, 2 | Complete | Participant(s) | Pre, enhanced post (ASPI, 2011) |
| Europe - Africa | 1, 2 | Complete | Participant(s) | Pre, enhanced post (Hayes, 2009) |
| US - Caribbean | 2 | Complete | USSCFR (2011) | Pre, enhanced post  |
| UK - France | 2 | Complete | UKBA (2011) | Pre, enhanced post |
| **Red** = robust border security e.g. extended physical wall/fence or multi-dimensional technologies, largely impermeable |
| Israel – Palestinian Territories | 1, 2 | Complete | Participant(s) | Pre, enhanced post (Jones, 2011) |
| US - Mexico | 1, 2 | Complete | Participant(s) | Pre, enhanced post (Global Security, 2011) |
| India - Bangladesh | 1, 2 | Under construction | Participant(s) | Post (Jones, 2011) |
| Morocco - Western Sahara | 1, 2 | Complete | Participant(s) | Pre (Cutler, 2005) |
| Cyprus: North – South | 1, 2 | Complete | Participant(s) | Pre (Cutler, 2005) |
| Malaysia - Thailand | 1, 2 | Under construction | Participant(s) | Post (Farrell 2010) |
| Ceuta - Morocco | 1, 2 | Complete | Participant(s) | Pre (Farrell 2010) |
| Melilla - Morocco | 1, 2 | Complete | Participant(s) | Pre (Farrell 2010) |
| North Korea - South Korea | 2 | Complete | Cutler (2005) | Pre |
| Kuwait - Iraq | 2 | Complete | Cutler (2005) | Pre |
| Botswana - Zimbabwe | 2 | Complete | Phillips (2004) | Post  |
| **Orange** = semi-robust border security e.g. incomplete physical wall/fence or enhanced but inconsistent technologies |
| Afghanistan - Pakistan | 1, 2 | In preparation | Participant(s) | Post (Nation, 2011) |
| Brunei- Limbang | 2 | Complete | [Curtis](http://blog.heritage.org/author/rpirrong/) (2011) | Post |
| Burma - Bangladesh | 2 | Under construction | Allchin (2012) | Post |
| China - North Korea | 2 | Under construction | Ossenova (2006) | Post |
| India - Tibet | 1, 2 | N/A | Participant(s) | N/A |
| Iran - Pakistan | 2 | Under Construction | One India (2011) | Pre, (Fiske, 2000) enhanced post |
| Libya - all borders | 1, 2 | In preparation | Participant(s) | Post (Kington, 2009) |
| Saudi Arabia - Yemen | 1, 2 | Under construction | Participant(s) | Post (Cutler, 2005) |
| Saudi Arabia – Iraq | 2 | In preparation | Ossenova (2006) | Post |
| Saudi Arabia – all borders | 2 | In preparation | CTW (2011) | Post  |
| Russia - Norway | 2 | Complete | Staalesen (2010) | N/A |
| South Africa - Zimbabwe | 1, 2 | Complete, damaged | Participant(s) | Post (Modise, 2009) |
| Turkey - Greece | 1, 2 | Under construction | Participant(s) | Post (EU Business, 2012) |
| Uzbekistan - Afghanistan | 2 | Complete | Suleyman (2005) | Pre |
| Uzbekistan - Kyrgyzstan | 2 | Complete | IRIN (2012) | Pre |
| UAE – Oman | 2 | Under Construction | Borger (2007) | Post |
| **Yellow** = extended border security but remains largely inconsistent or weak, relatively permeable |
| Canada - US | 1, 2 | Under construction | Participant(s) | Post (CNS, 2006) |
| Mali - Mauritania | 1, 2 | Under Construction | Participant(s) | Post |
| Ukraine - Romania | 1, 2 | N/A | Participant(s) | Post (EC, 2012) |
| Ukraine - Poland |  | N/A | EC (2012) | Post  |
| Moldova - Romania | 1, 2 | N/A | Participant(s) | Post (EC, 2012) |
| Morocco - Algeria | 1, 2 | Under Construction | Participant(s) | Post |
| Russia - Chechnya | 1, 2 | In preparation | Participant(s) | Post (Farrell, 2010) |
| Israel - Golan heights (Syria) | 1, 2 | Under construction | Participant(s) | Pre (Gold, 2008) |
| Israel - Jordan | 1, 2 | In preparation | Participant(s) | Post (Zhi, 2012) |
| Israel - Egypt | 1, 2 | Under construction | Participant(s) | Post (Jones, 2011) |
| India - Burma | 2 | Under construction | Chakraborty (2010) | Post |
| India- Pakistan | 2 | Under construction | Cutler (2005) | Pre  |
| Russia - China | 2 | Complete | Grayson (2010) | Unknown |
| Russia – Mongolia | 2 | Complete | IHNET (n.d.) | Unknown |
| Uzbekistan - Turkmenistan | 2 | Under Construction | ICG (2002) | Pre |
| Qatar- all borders | 2 | In preparation | CTW (2011) | Post |
| Border security implementation at unknown dates in 2001, are classified as pre 9/11 for the purpose of categorisation. |

**5.1 Accelerating ‘Intelligent’ Border Construction.**

In an Interview with (Humble, 2011), Ben Hayes, described borders becoming increasingly restrictive, particularly surrounding the West, through implementing policies and advanced border control technologies

*“[a] legacy of 25 plus years of tighter and tighter border controls in the west, the export of those controls and this [...] ‘we’ve got to keep tightening the borders, ever tighter, ever tighter, ever tighter’, we’ve done all the legislative stuff in Europe and now here we are going for this Euro, sort of, super high-tech techno-security paradigm with every kind of satellite, surveillance, censors and drones and all the rest of it.”* (Humble, T.,(2011) Interview 1, Paragraph 9)Hayes explained:

 *“Go back to probably about 10 years ago, where they first did the action plans on, I think it was 6, targeted countries that were seen to produce lots of refugees and migrants bound to Europe and that included Iraq, Afghanistan, Sri Lanka, and basically ever since then the EU has been providing either through its own programmes or through technical assistance from the member states have been providing support for border control, technology development, liaison officers, all of those things, so I would guess they have a presence in dozens of countries now globally dealing with immigration.”* Humble, 2011,(Interview 1, Paragraph 1)

In Humble’s study (Humble, 2011), several of the participants argued that the transfer of border controls is often to nations who traditionally had in-effect highly porous borders. For example, Wirsching argued:

“*In Africa (at least in Western and North Africa) since EU migration and border policies are increasingly externalized they lead to similar tendencies in Africa that did not exist before the EU migration and asylum policies in 1999 when there was [any] hardly border monitoring between artificial nation states.”* (Humble, 2011,Interview 8, Paragraph 4)

Wirsching emphasized that the ‘externalisation’ of EU migration management has resulted in states who previously afforded limited attention to border controls, now implementing localised cross-border security measures and migration restriction, in order to stem the flow of migrants towards Europe (Ibid.). Hayes took this point further, arguing a domino effect of border securitization:

*“[when a country] introduces border controls, strict ones, it inevitably has a knock on effect on the country next door, and it is that country that is then identified as a transit country, the receiving state then starts putting pressure on the transit country, saying “hey, guess what, you’ve got to tighten up your border controls”, and [...] spreading miraculously through the world, through this sort of twin processes of technical assistance and technology transfer”* (Humble, T.,2011:Interview 1, paragraph 5)

Hayes suggests that the spread of border securitisation is not just the result of formal externalisation policies but also comes from political pressure and thus transfer of border security measures. If correct, an assumption can be made that this domino effect is not restricted to particular regions, but can materialise anywhere that nations put emphasis on securitising borders and blocking migrants.

**5.2 A Paradigm Shift?**

Information on border security in Humble’s study was greatly focussed on Europe, America and their neighbours, suggesting that border securitisation has seen greater proliferation in and around Western states, which the weight of comparative literature also indicates. (Pécoud &Guchteneire, 2006) support this, claiming it is Western nations that are increasingly fortifying themselves against the rest of the world. However, the participants also mentioned non-Western states which are employing enhanced border security, and accumulatively, named 28 international borders across the globe with securitised borders.

**The map** above, titled **Map 2,** provides a more comprehensive illustration of global border securitisation, from cases identified in secondary research alongside the information provided by the participants in Humble’s 2011 study. The security capacity and stage of development vary greatly between the identified borders, as does the permeability of the borders. Her study broke down these variations into four broad categories, provided in the corresponding keys, namely:-

* (i) Robust maritime security with multi-dimensional technologies including surveillance (green);
* (ii) Robust land security with physical walls and fences with multi-dimensional technologies which are very difficult to pass irregularly,(red);
* (iii) Semi-robust land security – incomplete physical walls and fences or enhanced but with incomplete technology;(orange);
* (iv) Strong but inconsistent border security mechanisms which mean the border remains relatively porous, (yellow).

Map 2, illustrates that border securitisation is far from limited to the Western hemisphere. Of course these summaries are best seen as mere snapshots, more border fences are being erected all the time and the role of corporate assistance in these ventures needs to be further studied However, certain patterns do emerge in regard towhether or not there has been a shift’ in border securitisation. Previously, writers such as Salter (2005) and White’ (2011), claimed that there had been no significant change to border security following 9/11.

Analysing the data provided in Map 2 in Humble’s 2011 study, provides a clear conclusion. Of the total 47 identified borders, 25 have employed measures of securitisation post 9/11. Six had security measures constructed before 2001, but had enhanced their controls after. There were 12 cases of border securitisation found to have been implemented prior to 9/11 and had remained relatively unchanged. (See Chart 1). (Implementation timeframes of four of the identified borders could not be determined). Therefore, the number of securitised-borders, have more than tripled in the last 11 years. Furthermore, one third of borders which already had strong security controls further heightened their security within this timeframe (See Chart 2). The charts reveal fence builders certainly cashed in on Post9/11 state insecurity.

**Chart 1: Number of International Borders with Enhanced Border security- developed pre and post 9/1l (From *Humble, T, 2011)***

*Sources: Interviews and secondary (online) sources*

Post 9/11, global government, according to Visiongain (quoted by Hayes,2012) spent $178 billion in 2010 alone, with a forecast global spend on homeland security over the next decade of some $2.7 trillion. Within that border security was scheduled for an estimated spend of $15.8 billion in 2010 and biometrics associated with identification management to top $11.2 billion in 2015(Ibid).

Hayes (2012) underlines the role of large multinational defence contractors, or “primes” in servicing that market. In Europe the five big mega defence conglomerates, EADS, BAE Systems, Finmeccanica, SAFRAN and Thales are core. In the USA the huge military systems corporates are Lockheed-Martin, Boeing, Northrop Grumman, Raytheon and General Dynamics. Given the growing importance of biometric borders, IT conglomerates such as L3 Communications, Hewlett Packard, dell, Verizon and IBM in the US, and Eriksson, Indra, Siemens Diehl and Sagem in Europe: have all become key players in many recent initiatives.

Few other corporates could manage the enormity of the security contracts implemented post 9/11, but according to Hornqvist, they bring with them an associated mindset “that correspond more closely to military logic: neutralising, knocking out and destroying the enemy.”(Hornqvist, 2004,p35) Graham, also warns of the dangers of blurring the lines demarking civilian law enforcement from military power. The resultant polarization lends itself to creating enclaves of securitized privilege for “*those who are risk-free and in need of protection to live, work and play – as well as enforcing the rules in archipelegos of human disposal, warehousing and incarceration.”* (2010, p90),

Within Europe the new security agenda was operationalized with an annual €200 million budget, by the European Security Research Advisory Board (ESRAB) in April 2005, which set the EU security research priorities programme, via FP7, for 2007-2013. (Hayes 2010) report for TNI and Statewatch, *Neoconopticon,* expertly demolishes the processes which operationalize this programme, from bringing in big business to setting up a trusted “group of personalities” to create a “Homeland Security” style policy framework to police Europe’s future. Hayes found that within that agenda, nearly half (50%) of the projects eventually approved were contracted to organisations, either servicing the defence or security sectors.

Hayes then maps out what has emerged as a militarised approach to immigration control, through maritime initiatives such as CHENS(Chiefs of European Navies 20 year vision for their future role; The European Border Surveillance System (EUROSUR), which includes an expansion of border surveillance into space via the Maritime Security Service Project(MARISS) which was led by Telespazio(Finmeccanicca-Thales joint venture co) and included EADS, Astrium, Qinetiq, SELEX-Si and Starlab, (2010,p37) Also included in the FP7 programme was the €20 million TALOS project, designed to integrate autonomous border control systems based both in aerial vehicles and in ground robots.

Neoconopticon provides the first crucial attempt to get a handle on the reframing of border security architecture now emerging and the significance of such incremental steps as “interoperability” to create a flexible system of security capability sets. It identifies the industry-university- policy partnerships which facilitate this overall securitization. and In Europe’s case, it details how this will be managed by the newly created border management agency FRONTEX – whose war on migration covers the coast of Africa, the war zones of the Middle East and the many inconvenient islands in the Mediterranean.

For the “primes” these contracts are immensely lucrative. The EADS contact to install surveillance equipment over 9000 kilometres of Saudi Arabian borders, including, deserts, mountains and borders, will yield between €1.5 and 1.6 billion.[[25]](#footnote-25) The Boeing contract covers both borders the US has with Canada and Mexico – some 7,500 miles. The 3 year contract is worth €2.1 billion and includes many commercial partnerships; not least we are told by the BBC, with an Israeli company that makes cameras which can spot people 14 kilometres away.[[26]](#footnote-26)

Is there any trend here for Pariah states like Israel to export expertise and tacit targeting knowhow built up via its illegal occupation of Palestine, to other control zones? Prof Stephen Graham certainly thinks so. “*What was striking…is that Israel’s military and security technology, doctrine and expertise have rapidly been mobilized and generalized as part of the US global war on terror.” (Graham, 2010, p228).* He quotes Michael Evans, ‘*Significant theoretical analyses were completed by RAND Corporation scholars, focusing on the technical and tactical peculiarities involved in conducting military operations inside cities.’*(Evans, 2007)

Graham goes to quote an extraordinary account of US soldiers being present in IDF uniforms during the final stages of the massacre associated with the Israeli clearance of the Jenin refugee camp during April 2002[[27]](#footnote-27). This anti-democratic “liveware” transfer of working knowledge is potentially corrosive.

One of Humble’s 2011 interviewees confirmed such corporate links between Israel, the US and Rand Corporation in building the Mexican fence:

*“... there is a huge military industry that lobby and need investments and walls [are] becoming one of the so-called home wall security-industry investments. So when you talk about the wall here in the West bank [it] costs Israel around 2million dollar[s] per kilometre. For example in 2005 they said they’d need around 500million dollar[s] of the wall of high-tech for the wall, from cameras, to sensors, to wireless telecommunications, to check points, to metal detector and all of this, so imagine all of this goes to the high-tech industry, the military and the semi-military high-tech industry.”*(Humble, 2011,Interview 3, Paragraph 3)

And it’s not just fences being bought and sold. When Brazilian Jean de Menendez was executed in a London tube on 22nd July 2005, by a dum-dum bullet fired into his spinal cord by a Metropolitan Police Firearms Officer in plain clothes, few were aware that this so called Kratos technique of assassination, had been a product of Met-Israeli security liaison. In future, attempts to resist containment actions which go beyond the law: ascertaining the roots of any corporate and ideological origins of associated policy and technology, will become increasingly important.

**5.4 Global Border Securitisation[[28]](#footnote-28)**

Map 2 shows, the highest intensity of border securitisation is largely clustered around Europe, America, the Middle-East and southern Asia. Territories with similar developments include North Africa, Central Asia and Russia and other isolated cases exist elsewhere.

Referring to Map 2[[29]](#footnote-29), the borders of America are becoming increasingly fortified, with the US – Mexico border having multiple layers of security deployments. A virtual wall of surveillance is being constructed along the Canadian border and the Maritime area between the South East and the Caribbean is strongly guarded. Europe is also becoming increasingly impenetrable, particularly the maritime borders to the South. The Greece-Turkish land border, which is reported to be the route taken by 80% of undocumented migrants’ entering Europe (Vandystadt, 2012) has Frontex deployments (BBC, 2011) and Greece has begun to construct a fence along a portion of the crossing. To the North West, barriers also exist intermittently along outer European borders with Russia.

In North and West Africa, Morocco has increasingly guarded borders with Algeria and so does Mauritania with Mali. Morocco has a 1,500 mile long mixed sand and stone barrier lined with mines along the Western Sahara territory and Libya recently bought a 300 million Euro security contract with Finmeccanica[[30]](#footnote-30) to securitise all its borders. In the South, electric and barbed wire fences secure the Zimbabwe-Botswana border and the Zimbabwean–South Africa border respectively.

The Middle East has a large number of highly secured borders, most notably between Israel and the Palestinian Territories. There is a highly secured barrier under construction between Oman and the United Arab Emirates and between Saudi Arabia and Yemen, meanwhile in 2009 EADS Defence and Security[[31]](#footnote-31) was contracted to securitize all of Saudi Arabia’s borders.

Carney, Milkian and Hoelscher(2011), coined the term ‘Fortress India’, referring to the heavily guarded 1,790-mile border fence around Bangladesh, parts of which are electrified (Wright, 2012). India is also deploying border securitisation across its borders with Pakistan, Tibet, Burma and the Kashmiri region. Pakistan has plans for a mine-lined fence with Afghanistan, but the extent that this will be realised is uncertain due to economic factors (Nation, 2010). Central Asia also has some fortified border security zones, such as between Uzbekistan and Kyrgyzstan, and Uzbekistan and Afghanistan.

Further East, Russia has an extensive low security barbed wire fence along its borders with China and Mongolia. Both of North Korea’s land borders are becoming increasingly highly secured, and Brunei and Limbang, and Malaysia and Thailand both have heightened border security between their respective shared borders.

 An extensive network of maritime security systems guard Australia’s northern sea border. As Mark Levene has argued:

**“***… we live in a world of nation-state ; formerly porous frontiers are now inviolable borders….”* (Humble, 2011, Interview 6, Paragraph 6)

Here, Dr. Levene summed up the views given by the majority of the participants in Humble’s 2011 study: that state borders are becoming increasingly impermeable. As Map 2 indicates our world is riddled with international borders that are increasingly difficult to pass, indicating evidence to support Jones’ observation that this is the most “bounded and ordered world” we have yet experienced. Nevertheless, many zones still retain their traditional permeability, a point recognised by one of Humble’s expert participants, Purkayastha, who argued:-

*“I do think that border issues or border controls are actually increasing. Even then, there is a significant difference in terms of formal controls [...] In most developing countries, there is talk of increasing physical controls, [but] the actual borders are quite porous. [...] The rhetoric does not yet match the actual controls.”* (Humble 2011,Interview 7, Paragraph 1)

Referring to Map 2, it is clear that Purkayastha’s assertion is fundamentally correct. The majority of borders in Africa, as well as the regions of South America, Central America and South East Asia, remain without bolstered security deployments, indicating the ability for people to move between states with relative freedom. Furthermore, Purkayastha argues that where border securitization has been introduced outside of the West, this has not resulted in borders being sealed off in practice). Indeed, Map 2, supports Purkayastha’s view. In most, the border lines are yellow, which signals “strong but inconsistent, or extensive but weak border security” (See Key Table 1).

Nevertheless, the assertion that most international borders remain permeable for now, needs to be caveated. Firstly, as Dr. Hayes and Wirsching’s demonstrated, through the transmission of border controls, agendas of border securitization can shape border security in neighboring states to countries far removed. This is exemplified by the activities of the EC’s Border Management Program in Central Asia (BOMCA), which aims to increase capacity building of border management in the region (EC, 2012). This can have a further informal regional ‘knock-on effect’, as discussed by Dr. Hayes. Additionally, as previously illustrated, the highly lucrative security-industry complex holds a strong vested interest in the intensification and expansion of border securitization and in a “paradigm-shift” towards states militarizing borders (Smith, 2007).

Importantly, the timespan of this border securitization development should be considered. Over half of the identified securitized borders developed enhanced security in the last 12 years alone, demonstrating a very recent growth. A new paradigm of border securitization is *emerging*. This is not the end of the narrative, but the beginning. The next section envisions what we might anticipate, if the current processes of militarization continue.

The permeability of securitised borders varies greatly (indicated in Map 2), as does the consequences: forced ‘lock-in’, discussed earlier by Maccanico, such as with the Palestinian Territories (Jones, 2011) or increasingly dangerous migration routes, or both, depending on the border security as well as the crisis and the individuals involved personal circumstances, which Warner, Olivia and Stal explain, determines who migrates and in what numbers (2008). According to the World Bank, as presented at [COP 17 in Durban](http://www.cop17-cmp7durban.com/) 2011, a five degree rise in temperature can be expected if we continue at our current rate of GHG emissions (World Bank, 2009). Such a rise may mean whole regions would become inhabitable due to events like sea-level rise and desertification (GHF, 2010). In such a scenario, the migration ‘push factor’ in many regions, may be very difficult, if not impossible, to remedy.

**6. BORDERS AS BATTLESPACESTHAT SEE: TOWARDS AUTOMATED EXCLUSION**

We now live in an era of ubiquitous surveillance especially in urban areas. Post 9/11, this surveillance capacity has been significantly upgraded. As military level systems have entered service, security is increasingly defined in national security contexts, and a politics of insecurity, risk, suspicion and prevention.(Bigo, 2012)

Military surveillance systems are blanket rather than refined. But post 9/11 urban warfare doctrine has melded such distinctions. Military planners now envisage fighting in hostile mega cities of the Urban South, how can military forces function in places where there might be no GPS communications or high buildings which obscure real threats. Graham analysed the emergence of a new raft of R&D by US military laboratories to render the complex city scapes transparent through advanced surveillance technology. (Graham 2009,.2010). The US Defence Advanced research Projects Agency, (DARPA) for example, sponsored initiatives such as ‘Combat Zones That See, around 2003 with sci-fi notions of tracking whole populations through motion analysis via ubiquitous sensors, number plate recognition and face recognition programmes and a ‘Visibuilding’ programme which allowed state agencies to look through buildings for human activity. Within this framework, surveillance capacity was coupled with automated armed, self-deciding robotic systems. Even nature is being harnessed to provide added surveillance capacities on land, sea. Air and space.( See Haggerty & Trottier, 2013)

Such scenarios were fictional prior to the Iraq insurgency, but subsequently we have had inklings of just how much has changed in terms of military capability sets. Over the summer of 2013 for example, the Guardian made a steady stream of shocking stories based on data provided by former Booze Allen analyst, Edward Snowden, that the US Military Intelligence’s National Security Agency (NSA), was surveilling all social media, through a programme named PRISM.[[32]](#footnote-32)

Post 9/11, we know that most UK cities have a so called ring of steel around them – an urban CCTV surveillance and number plate recognition system which can play abck every entry into the city zone. Post 2011 summer riots in the UK, the Guardian revealed that the Met Police were using a system from Leeds based company Datong plc, which could gather information from mobile phones, over 10 square miles radius?[[33]](#footnote-33) The city even has litter bins that can track mobile phones.[[34]](#footnote-34) Post 9/11, surveillance has been enhanced at special major events like the London 2012 Olympics but also across many urban spaces but especially at ports and borders.

Borders are some of the most intensely surveilled places on Earth. As pinch points we might anticipate substantial expenditure in upgrading capacities at borders, from biometric systems of social sorting, to watching systems that can spot anomalous behaviour..

Hayes (2009) catalogues what he calls full spectrum surveillance, facilitated by what he terms a “digital tsunami.” He cites the UK data retention scheme which has enabled the British police to get access to telecommunications a staggering 519,620 times in 2007. It also granted capacities from ‘undetectable bugs, tracing technologies and “spyware”’, to granting “cross-border powers over multi-nationals service providers so states can conduct “foreign communications surveillance” as easy as domestic surveillance. (Ibid, p43) Other significant developments identified by Hayes include:-

* Calls for improved “situational awareness – with the European Security Research and Innovation forum(ESRIF) encouraging the private sector to find new ways of fusing data gathered by a vast array of sensors “based on ground, air and space.” ;
* ISCAPS project on surveillance of public spaces;
* The Probant and HAMLET projects on the tracking of persons;
* The TRIPS project on Surveillance of railway stations;
* EUROCOP project on geospatial information for pedestrian police officers
* SUBITO programme on “real time detection of abandoned luggage(Ibid, p45)
* HUMABIO project which uses behavioural analysis for human monitoring and authentication, using a network of cameras;
* SAMURAI project on ‘detection of suspicious and abnormal behaviour’;
* INDECT project on automatic detection of threats;
* ADABTS project on “Automatic Detection of Abnormal Behaviour. In Crowded Spaces (led by Swedish, prime, FOI and Dutch prime, TNO) (Ibid, p4)

To name but a few. But the most significant developments are probably the two satellite based surveillance developments Galileo And Kopernikus. This massively expensive project with Galileo alone costing an estimated €3.4 billion, facilitate a myriad of satellite tracking functions Kopenikus will provide the backbone for ground based sensors and Unmanned Aerial Vehicles(UAV), to monitor people and the environment.

According to Neoconopticon, the EU has supported at least a dozen UAV projects under various framework research programmes including BSUAV and WI-MA2S, for border surveillance(.Hayes, 2009,p55) Elsewhere, the use of armed UAV’s by the US across borders in places like Pakistan and Afghanistan on assassination missions, has sparked enormous controversy[[35]](#footnote-35). A crucial concern for NGO’s such as Human Rights Watch and ICRAC, is the prospect of these systems becoming fully autonomous[[36]](#footnote-36). We already have semi-autonomous precursor operations, or so called signature strikes where targets are chosen automatically because they resemble similar situations where the use of lethal force could be justified.

Although such terminator scenarios sound like science fiction, the rapid justification and escalating deployment of the US drone-led assassination strategy, shows how quickly things can change. South Korea has already fielded the armed Samsung SGR-1 robot on its border, the demilitarized zone with North Korea.[[37]](#footnote-37) Whilst the SGR-1 has autonomous surveillance functions, it needs human permission to open fire on live targets.

Other less intelligent killing systems are more autonomous. For example, the lethal “self-healing” minefield uses neural network to reposition mines if a border zone is breached.[[38]](#footnote-38) Another variant which can be either lethal or sub lethal, is metal storm’s virtual minefield, which designates where “mines” are on a virtual map held by a surveillance system which could be anything from an UAV or even a satellite. Cameras react to any physical breach by launching multiple mortar strikes to the designated spot.[[39]](#footnote-39)

The security vulnerabilities of long interstate borders or parts of critical infrastructure can be used to justify 24/7 surveillance – a thankless and relentlessly dull albeit critical task which will always be presented as ripe for automation, either by ground based or UAV robotic system with either surveillance or guns or both.

Already we have inklings of intent. The pentagon made a call for contractors to provide a “multi-robot pursuit system” that will let a pack of robots “search for and detect a non-co-operative human.” According to Wright, *"What we have here are the beginnings of something designed to enable robots to hunt down humans like a pack of dogs. Once the software is perfected we can reasonably anticipate that they will become autonomous and become armed.”[[40]](#footnote-40)*

That was way back in 2008. Just this year (2013), New Scientist reported on drone systems which could tag those found in unauthorized spaces, (Hambling, 2013) – again setting off unsavoury images of tracking and hunting down unco-operative humans.

Of course the ‘battle-spaces that see’ mentioned above, also include ordinary citizens armed only with a mobile phone camera…and instant access to worldwide social networks. Eyewitness images of lethal robots running amok in a crowd of refugees, with all the Hollywood associations with terminator, could destroy any semblance of public justification. However, we can anticipate PR spin-doctors far more easily justifying sub-lethal options based on “harmless weapons,” even if they are not.

Again, we have inklings of future configurations. In 2007, irobot struck a deal with Taser International to mount their neuro-muscular incapacitation weapons on its military robots Taser’s shotgun fired wireless taser projectile, XREp, was initially seen as a natural tool for military robots on guard duty – but was recently withdrawn because of technical limitations.

We can logically anticipate such technical setbacks to eventually be overcome. It is a similar story with directed energy weapons, such as the micro-millimetre wave active denial systems (nicknamed the ‘pain beam’) and Ionotron’s shock inducing UV lasers, and the pulsed energy projectiles. (See Altmann, 2008). So much money has been invested in them, we can anticipate both further miniaturization enabling robot systems to carry such weapons, or their larger scale static deployment at borders and around critical infrastructure. Currently, drones within the US can only be used for surveillance, but the Electronic Frontier Foundation has uncovered proposals to weaponize them with less-lethal weapons.[[41]](#footnote-41)

Powerful directed energy systems capable of shocking would-be migrants, very long distances away are already now beyond prototype stage, and can be made autonomous and victim activated. Adverts for Raytheon’s Silent Guardian[[42]](#footnote-42)

Coupled with drone surveillance to automatically track would-be illegal aliens, state agencies under duress, could decide these form a logical continuation of current policy. Investors will enjoy the benefits of cashing in on climate change security fixes, as state after state; adopt ‘21st century border control solutions’. But we could and should evolve alternatives – as if people mattered.

**7. CONCLUSION – TOWARDS RESISTING CONTAINMENT**

None of these predictions are necessarily deterministic, despite state-security orientated border control options being massively funded at taxpayers’ expense. In the long run, as Biermann and Boas (2008) suggest, what we actually need is a global protocol to protect climate refugees. Instead, we are liable to get two vastly different political economies of containment: one based on petty criminal black market dodges to get across borders with professional human traffickers; the other, grandiose hi-tech so called geo-engineering schemes, or Plan B.

Already, we have evidence of criminal gangs exploiting migrants wishing to exploit migrants’ need to leave Morocco for Spain, whilst the authorities turn asylum seekers back, allegedly with resources provided by the EU.[[43]](#footnote-43) Similarly in Palestine, black economies have grown up around the Israeli containment wall.[[44]](#footnote-44) Ordinary people must find a way through, but at a cost.

In September 2013, in a Speech to the annual British Science Festival, Astronomer Royal Lord Rees argued for some form of geo-engineering, which means some kind of planet-scale intervention to either cool the earth or soak or carbon dioxide[[45]](#footnote-45). The context is our failure to prevent C02 emissions continuing to rise.. Rees says he is pessimistic about our ability to contain further rises – already running at 400ppm in May 2013:

“*If the effect is strong, and the world consequently seems on a rapidly warming trajectory into dangerous territory, there may be a pressure for ‘panic measures’..’These would have to involve a ‘Plan B’ – being fatalistic about continuing dependence on fossil fuels but combating its effects by some form of geoengineering.”*

Rees is sanguine about the risks of such an intervention and the potential nightmare unanticipated consequences. But if establishment thinking is between containment and geo-engineering, NGO’s must create a critical mass of thinking in support of other alternatives which are more sustainable, and do so on paltry resources. At the time of writing, there are already numerous geo engineering projects, some of which have been mapped by the ETC group[[46]](#footnote-46). Already evidence has been presented that Russia is pushing for future IPCC reports, to have a section in support of “planet hacking”. This is despite the UN moratorium on geoengineering which was agreed at the Biodiversity conference in 2010

A key contribution has to be research activism, since far too few people are au fait, with the whole area of security planning options. Hayes (2009) advocates new forms of research activism which will lead to substantial reform of the EU system of governance to prevent it becoming even more militarised. *Neoconopticon* is a contribution to this debate and some of the NGO’s concerned about these developments, including Statewatch and CIES, helped formulate a new series of ethical and societal checks and balances on way all future security research funded by the EC.

Graham, (2010) advocates “counter geographies,” to confront the new military urbanism, first by information but also with confrontation creative cartographies which create a public dissonance between what is being planned and the “official version. A key emphasis is on non-violence and art to shock people out of their passive somnolence, of the kind advocated by organisations such as EPKOT, who do public performances using full scale robotics and curate agi-prop events – embedded art in the name of security.[[47]](#footnote-47)

Other NGO’s such as Human Rights Watch and ICRAC have undertaken a worldwide campaign for a new arms control regime to prevent the deployment of autonomous killing systems. These partnerships have been remarkably successful. Using ICRAC’s expertise to provide heavyweight intellectual muscle (Asaro, 2012) was far more effective when married to Human Rights Watch’s (HRW) campaigning expertise and world wide networks. Following the publication of HRW’s report on Losing Humanity.(HRW, 2012), the joint campaign was launched in London, in April 2013 at the Amnesty International offices and quickly secured world-wide publicity, including the backing of Christor Heynes,the UN Special Rapporteur on Extra-judicial Killing, who warned of machines killing humans without supervision.[[48]](#footnote-48)

A core reservation for HR. is the difficulty in adequately establishing proper accountability if things go wrong, Charles Raab calls for a refocus on the importance of principles when attempting to regulate surveillance( Ball, 2012,p377) Gillom and monaham take this further and argue that *“everyday resistance” was an important and productive dimension of anti-surveillance politics.*(Ibid, p408) Perhaps similar politics will play out in resisting the militarisation of climate change? By such small steps can wider humanity play its role in reframing the proffered solutions to the costs and benefits of achieving a decarbonised future?

**REFERENCES**

Alexander, J.B., (1999): *Future War: Non-lethal Weapons in Twentieth Century Warfare*, St. Martin’s Press, and and New York.

Altmann, J., (2008): Millimetre Waves, Lasers, Acoustics for Non lethal Weapons – Analyses and Inferences, Deutsche Stiftung FriedensforschungGestaltung, Satz und Herstellung: atelier-raddatz.de und DSFDruck: Günter Druck GmbH, Germany.

Amnesty International (2002) *Terror Trade Times, Issue No.3,* June*,*

<http://www.amnesty.org/en/library/info/ACT31/001/2002/en>

Amnesty International (2003) ‘*The Pain Merchants- Security Equipment and Its Use in Torture and Other ill treatmen’* Amnesty International London. Available from: <http://www.amnesty.org/en/library/info/ACT40/008/2003>

Available from: <http://www.scribd.com/doc/97980013/Millimetre-Waves-Lasers-Acoustics-for-Non-Lethal-Weapons-Physics-Analyses-and-Inferences-Jurgen-Altmann>

Arthur C., and Wright, S.(2006): ‘Targeting the Pain Business’ *The Guardian*, Oct 5 Available from <http://www.theguardian.com/technology/2006/oct/05/guardianweeklytechnologysection>

Asaro, P., (2012):“On banning autonomous weapon systems: human rights,

automation, and the dehumanization of lethal decision-making.” *International*

*Review of the Red Cross*, 94(886), June, pp. 687-709.

Asian Development Bank (2012) *Addressing Climate Change and Migration in Asia and the Pacific.* Philippines, Asian Development Bank. Available from: <http://beta.adb.org/sites/default/files/pub/2012/addressing-climate-change-migration.pdf>> .

Baker, J. Ehrhart, C. and Stone, D. (2008) Hotspots – predictions and action. *Forced Migration Review*. 31. pp. 44 – 45.

Ball, K.,Haggerty, K.D., & Lyon, D., (2012): *Routledge Surveillance Studies Handbook*, Routledge, Abingdon,UK.

BBC (2011): Greece plans Turkey border fence to tackle migration. *BBC News* [Internet], 4 January. Available from: <<http://www.bbc.co.uk/news/world-europe-12109595>> [Accessed 8th April].

Biermann, F., & Boas, I.,(2008):Protecting Climate Refugees: The Case for a Global Protocol, *Environment- Science and Policy For Sustainable Development,* 50(6): 8-16,Nov-Dec. <http://www.earthsystemgovernance.org/publication/biermann-frank-protecting-climate-refugees>

Bigo, D., (2012): Security, Surveillance and democracy, in Ball et al. (2012) pp277-284

Bolton, M., (2014); From Minefields to Minespace: An Archeology of the Changing Architecture of Autonomous Killing in US Army Field Manuals, *Political Geography,* forthcoming…

Brown, O., (2007): *Climate Change and Forced Migration: Observavtions, projections and implications. Human Development Report 2007/08*. Geneva, United Nations Development Program.

Brown, O. (2008). The numbers game. *Forced Migration Review*. 31. pp. 8 - 9.

Brauch, H. G., (2005): Threats, Challenges, Vulnerabilities and Risks in Environmental and Human Security*, Studies of the University: Research, Counsel, Education* (1) Bonn,UNU-EHS SOURCE Publication.

Brzoska, M., (2012): ‘ Climate Change as a driver of Security Policy,’ In Scheffran et. al., (2012)pp.165-184.

British Medical Association(2007): *The use of drugs as weapons: the concerns and responsibilities of healthcare professionals’,* BMA, London, 24 May.

[http://www.bma.org.uk/ap.nsf/Content/drugsasweapons?](http://www.bma.org.uk/ap.nsf/Content/drugsasweapons?OpenDocument&Login)

Castles, S. (2002) *Environmental change and forced migration: making sense of*

*the debate.* [Internet], University of Oxford, New Issues in Refugee Research - UNHCR Working Paper 70*,* Available from: <<http://www.unhcr.org/3de344fd9.html>>

Castles, S. and Miller, M. J., (2009): *The age of migration: international population movements in the modern world*. 4th ed. Basingstoke, Palgrave Macmillan.

Christian Aid (2009): *Human tide. The Real Migration crisis,* Christian Aid, London,

Cromwell, D., & Levene, M., (eds.) (2007): *Surviving Climate Change- The Struggle to Avert Global Catastrophe*, Pluto Press, London.

Crowley, M., (2013):*’Regulation of "wide area" riot control agent delivery mechanisms under the Chemical Weapons Convention'*, Bradford Non-lethal Weapons Project & Omega Research Foundation, April 2013 available at:

<http://www.omegaresearchfoundation.org/assets/downloads/publications/BNLWRP%20ORF%20RCA%20Munitions%20Report%20April%202013.pdf>

Cutler, A., (2005): Security fences, *The Atlantic Magazine*, March, Available from [http://www.theatlantic.com/magazine/archive/2005/03/security fences/3734](http://www.theatlantic.com/magazine/archive/2005/03/security%20fences/3734)

Dando, M, (2001)Genomics, Bioregulators, Cell Receptors and Potential Biological Weapons. *Defense Analysis* 12/2001; 17:pp.239-257.

Dando, M., (2002): ‘Future Incapacitating chemical agents: the impact of genomics,’ in Lewer, N., (2002).

Davison, N.,(2009): *’Non-Lethal’ Weapons,* Palgrave.

Doucet, I. and Lloyd, R., (eds.) ( (2001): *Alternative anti-personnel mines – the next generations,* German Initiative to Ban Landmines, Berlin and Landmine Action, London.

Doyle, M. (11 June 2012). “Obama’s drone wars and the normalisation of extrajudicial murder.” *The Guardian*. <<http://www.guardian.co.uk/commentisfree/2012/jun/11/obama-drone-wars-normalisation-extrajudicial-killing>>. Accessed 4 July 2013.

EU Business (2012): Eu refuses to fund ‘pointless’ Greece-Turkey border fence, *EU Business.* Available from [http://www.eubusiness.com/news-eu/greece-immigration,f17/](http://www.eubusiness.com/news-eu/greece-immigration%2Cf17/)

EC(European Commission) (2012): *European Neighbourhood Policy, EC.* Available from. <http://www.ec.europa.eu/world/enp/index_en.htm>

European Council, (2008): Joint Paper by the Commission and the Secretary General/High representative concerning, “Climate Change and International Security, to European Council, 3 March, Available at: <http://euractiv.com/29/images/SolanaCCsecurity%20reportpdf_tcm29-170886.pdf>

Evans, M.,(2007) *City Without Joy: Urban Military Operations into the 21st century,* Australian defence College. Occasional Series no.2, Canberra, Australia. Available from [www.strategicstudiesinstitute.army.mil](http://www.strategicstudiesinstitute.army.mil)

Farrell, N., (2010): *All you need is a (separation Barrier)* <Digital Audio File>, Third Coast Audio International Festival 2010, Available from: <http://www.thirdcoastfestival.org/library/914-all-you-need-is-a-separation-barrier>

Foresight (Foresight: Migration and Global Environmental Change) (2011*) Final Project Report.* London, The Government Office for Science.

Fiske, P., (2000) Border patrol with Iran’s drugbusters, *BBC News*, 19 May. Available <http://news.bbc.co.uk/1/hi/programmes/from_our_own_correspondent/755532.stm>

Geddes, A. (2003*): Still Beyond Fortress Europe? Patterns and Pathways in EU Migration Policy.* Liverpool, University of Liverpool.

GHF (Global Humanitarian Forum) (2009) *Human Impact Report: Climate Change - The Anatomy of a Silent Crisis*. Geneva, Global Humanitarian Forum.

Gold, D., (2008): The Golan Heights and the Syrian-Israeli Negotiations. *Jerusalem centre For Public Affairs, 8 (1) May. Available from* [*http://jcpa.org/article/the-golanheights-and-the-syrian-israeli-negotiations/*](http://jcpa.org/article/the-golanheights-and-the-syrian-israeli-negotiations/)

Graham, S. (2009); “The Urban ‘Battlespace.’” *Theory, Culture & Society*, 26(7-8), December, pp. 278-288.

Graham, S.,(2010): *Cities Under Siege: The New Military Urbanism,* Verso, London.

Guild, E (2009) *Security and Migration in the 21st Century*, Polity Press, Cambridge.

Haggerty, K.., and Trottier, D.,(2013): Surveillance of/and Beyond Nature: Monitoring Beyond the Human, *Society & Animals,* DOI: 10.1163/15685306-12341304 brill.com/soan. Available from <http://www.academia.edu/3727857/Surveillance_and_of_nature_monitoring_beyond_the_human>

Halpin, E., Trevorrow, P., Webb, D., and Wright, S., (2006): *Cyberwar, Netwar and the Revolution in Military Affairs*, Palgrave, New York.

Hambling, D.,(2002) ‘Star Wars hits the streets’, *New Scientist,* 176) 12 Oct, pp42-45, updated in ‘Stun Weapons to target crowds,’ *New Scientist,* (182), 19 June, 2004, p.24

Hambling, D., (2011): ‘Riot Shields could scatter crowds With Wall of sound.’  *New Scientist,* 14 December, Available from <http://www.newscientist.com/article/mg21228425.300-riot-shields-could-scatter-crowds-with-wall-of-sound.html>

Hambling, D., (2013): Tagging by drones could replace lethal strikes, *New Scientist***,** Vol 219, Iss 2931, Pgs 5-57, (24 August,**.**

Hayes, B. (2006): Arming Big Brother: The EU’s Security Research Programme, Transnational Institute (TNI)/Statewatch, Amsterdam.

Hayes, B., (2009): NeoConOpticon – The EU Security Complex, Transnational Institute(TNI)/Statewatch, Amsterdam. <http://www.statewatch.org/analyses/neoconopticon-report.pdf>

Hayes, B., (2012): ‘The surveillance –industrial complex’, in Ball et. al., 2012, pp.167-175

Hobbing, P.,(2010):*The Management of the EU's External Borders from the Customs Union to FRONTEX and E-Borders*. Brussels, Belgium [Centre for European Policy Studies (CEPS),](http://www.isn.ethz.ch/isn/Digital-Library/IR-Directory/Detail/?ots591=cab359a3-9328-19cc-a1d2-8023e646b22c&lng=en&id=13272)  pp. 63 -72.

Hornqvist, M., (2004): “The Birth of Public Order Policy”.*Race & Class*,*, 46(1)*,pp.30-52.

Human Rights Watch(HRW), 2012) Losing Humanity – The Case Against Killer Robots, Washington; Available from <http://www.hrw.org/reports/2012/11/19/losing-humanity-0>

Humble, T., (2011):*Pressure at the Levees – Exploring the Growth of Border Securitisation and its Impact on Climate Induced Migration*, unpublished thesis submitted in part fulfilment of BA in Peace Studies and International Relations, Leeds Metropolitan University.

IPCC(Intergovernmental Panel on Climate Change) (2007*): Intergovernmental Panel on Climate Change. Fourth Assessment Report*. Working Group II: Impacts, Adaption and Vulnerability, Geneva, Intergovernmental Panel on Climate Change. Available from:<http://www.ipcc.ch/publications_and_data/ar4/wg2/en/contents.html>

Jakobeit, C. & Methmann,C.,(2012): ‘Climate refugees’ as Dawning Catastrophe? A Critique of the Dominant Quest For Numbers’, in Scheffran et. al.(2012)

Jones, R.,(2011): Border Security, 9/11 and the enclosure of civilisation, *The Geographical Journal*, 177(3) September, pp.213-217

Klein, N. (2007): *The Shock Doctrine.*Penguin, London.

Kington, T.,(2009) Finmeccanica Expands Middle East Land Border Business, *Defense News*, 12 October. Available <http://mobileDeffensenews.com/story.php?i=4321235&c=FEA&c=SPE>

Klotz,L., Furmanski, M., & Wheelis, ., (2003): “*Beware the Siren’s Song: Why ‘Non-Lethal’ Incapacitating Chemical Agents are Lethal”,* Federation of American Scientists, Washington.

Lavenex, S., & Wichmann, N. (2009): The External Governance of EU Internal Policy. *European Integration,* 31 (1) pp. 83-102.

Lewer, N., (2002): ‘*The Future of Non-Lethal Weapons:Technologies, Operations, Ethics and Law,* Frank Cass, London.

Martin, B. and Wright, S., (2006) :Looming struggles over technology for border control, *Journal of Organisational Transformation and Social Change* [Internet], 3 (1) pp. 95-107. Available from: <<http://www.bmartin.cc/pubs/06jotsc.html>>

Mathiesen, T., (1999): On Globalisation Of Control:Towards an Integrated Surveillance system in Europe, Statewatch, London.

Modise, S., (2009): South Africa-Zimbabwe border fences disappear:Opposition expresses fears. *Afrik News*, 27 July. Available from <http://www.afrik-news.com/article15790.html>

Moore, H., (2000): ‘Laser technology Update: Pulsed Impulsive Kill Laser (PILKL), paper presented to NDIA (2000), Joint Services Small Arms Symposium, 29 August 2000, <http://www.dtic.mil/ndia/smallarms/Moore.pdf>

Myers, N. (2002). Environmental refugees: a growing phenomenon of the 21st century. *Philosophical Transactions of The Royal Society Biological Sciences*. 357 (1420) April, pp. 609 – 618. Available from: <[http://rstb.royalsocietypublishing.org/content/357/1420/609.full.pdf+html](http://rstb.royalsocietypublishing.org/content/357/1420/609.full.pdf%2Bhtml)>

Nation(2011): Pakistan to mine, fence Afghan border, *Nation.* Available from [http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/politics/24-June-2011/Pakistan-to-mine-fence-Afghan=border](http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/politics/24-June-2011/Pakistan-to-mine-fence-Afghan%3Dborder)

Omega Foundation (2000): Crowd Control Technologies – A report prepared for the STOA Panel of the European Parliament. Available from:

<http://www.yumpu.com/en/document/view/11273571/crowd-control-technologies-omega-research-foundation>

Pécoud, A. and Guchteneire, P., (2006): International Migration, Border Controls and Human Rights: Assessing the Relevance of a Right to Mobility. *Journal of Borderlands Studies*,21 (1) Spring pp. 69 – 86.

Pilisuk, M.,( 2008): *Who Benefits From Global Violence and War?,*Westwood CT: Greenwood/Praeger.

Renton, A. et al. (2009): *Suffering the Science: Climate change, people, and poverty.* Oxfam Briefing Paper, Oxfam, 6 July. Available from: <<http://www.oxfam.org/sites/www.oxfam.org/files/bp130-suffering-the-science.pdf>>

Salter, M.B., (2005): At the Threshold of Security: A theory of International Borders. In: Zureik, E. & Salter, M.B.,(eds.),(2005): *Global Surveillance and Policing: Border, Security and Identity,* Willian Publishing, Devon.

Scheffran, J., Brzoska, M., Brauch, H.G.,Link, P.M., & Schilling, J., (2012): *Climate Change, Human Security and Violent Conflict – Challenges for Societal Stability,* Hexagon Series on Human & Environmental Security and Peace, Vol. 8, Springer-Verlag, Germany.

Schwartz, P.,& Randall, D., (2004):An Abupt Climate Change Scenario and Its Implications for United States National Security, Contract Study for the U.S. Defense, Washington DC:DoD, Net Assessment –Emeryville, CA:Global Business Network. <http://www.gbn.com/articles/pdfs/Abrupt%20Climate%20Change%20February%202004.pdf> (Accessed August 2013)

Smith, P. J. (2007) Climate Change, Mass Migration and the Military Response. *Orbis,* 51 (4) Autumn, pp. 617-633.

Statewatch, (2006): ‘EU:border control for the 21st. Century-automated passenger processing’, 16(1)pp.1-2

Toffler, A. & Toffler, H., (1993): *War & Anti-War: Survival at theDawn of the 21st Century,* Little Brown and Co., USA

United Nations (2007): ‘Security Council Holds First Ever Debate on Impact of Climate Change on Peace, Security, Hearing over 50 Speakers, UN Security Council 5663 Meeting, 17 April.

United Nations (2009): “Climate Change and Its Possible Security Implications”, Report of the Secretary-General, A/64/350, 11 September, UN, New York.

UNU-EHS (United Nations University), (2005): “As ranks of ‘Environmental refugees’ Swell Worldwide, Calls grow for Better Definition, Recognition, Support, Available at: <http://www.ehs.unu.edu/file.php?id=58>

United States Space Command (1997): *Vision for 2020,* Peterson Airforce Base,2nd. Printing, August, Available at <http://www.fas.org/spp/military/docops/usspac/visbook.pdf>

Vandystadt, J (2012): ‘Greek problem’ at heart of debates on migration. *Europolitics: The European Affairs Daily* , 7 March. Available <http://www.europolitics.info/sectorial-policies/greek-problem-at-heart-of-debates-on-migration-art328238-16.html>

[Accessed 13th April 2012].

Warner, K, Olivia, D and Stal, S. (2008:) Field observations and empirical research*, Forced Migration Review*. (31) October. pp. 13-15.

Webb, D.C., (2007) ‘Thinking the Worst:The Pentagon Report, in Cromwell, D. & Levene, M.,(2007)

Wheelis, M., & Dando, M., (2005) Neurobiology: A Case Study of the Imminent Militarization of Biology, International Review of the Red Cross, Vol, 87, No 859, September. www.ikrk.org/eng/assets/files/other/irrc\_859\_whelis\_**dando**.pdf

White, G. (2011): *Climate Change and Migration: Security and Borders in a Warming World.* New York, Oxford University Press.

World Bank, (2009) *World Development Report 2010: Development and Climate Change*. US, World Bank.

Wright, S., (1998): *An Appraisal of the Technologies of Political Control*, STOA Panel, European Parliament. DG Research, 6 January. Available <http://cryptome.org/stoa-atpc.htm>

Wright, S., (2006) ‘Sub-Lethal Vision: varieties of military surveillance technology,’ *Surveillance & Society*, 4(1/2) 136-153

Wright, S., & Martin), B., (2006): ‘Looming Struggles Over Technology For Border Control,’ *Journal of Organisational Transformation and Social Change vol.3: No1, Intellect,*, pp.95-107

Wright, S., (2007a): ‘When Drugs become Weapons’, *The Guardian*, 24 May, <http://www.theguardian.com/technology/2007/may/24/guardianweeklytechnologysection.weaponstechnology>

Wright, S.,(2007b):’Preparing For Mass Refugee Flows- The Corporate Military Sector’ in Cromwell et al.(2007),pp.82-101.

Wright, S., (2012): ‘Policing Borders in A Time Of Rapid Climate Change’, in Sheffran et. al, 2012, chap 18, pp. 351-370.

Zetter, R., (2008): Legal and Normative Frameworks. *Forced Migration Review.* 31. pp. 62 - 63.

Zhi, C., (2012): Israel to build wall along Jordanian border:Netanyahu.*Xinhua News Agency.* 1 January. Available from: <http://news.xinhuanet.com/english/world/2012-01/01/c_131338741.htm>

1. For an excellent discussion, see Brausch, H.G., & Scheffran, J.,(2012) Climate Change, Human Security ad Violent Conflict in the Anthropocene, in Scheffren et. al., (2012)pp3-21 [↑](#footnote-ref-1)
2. Ibid, p6-7 [↑](#footnote-ref-2)
3. This section draws strongly on Humble, 2011 [↑](#footnote-ref-3)
4. See Asian Development Bank (2012). [↑](#footnote-ref-4)
5. SB 1070, full name Arizona Senate Bill 1070, gives the legal power to law enforcers to stop and detain anyone who they have ‘reasonable suspicion’ of being in the country without the correct legal documentation whilst verifying their status. This bill was been highly controversial and concerns of racial pro-filing have been raised. See: State of Arizona, Ministry of Citizenship (2010). [↑](#footnote-ref-5)
6. See at: <<http://www.bbc.co.uk/news/world-africa-12308243>> (31 Janaury 2011). [↑](#footnote-ref-6)
7. See Scheffran et. al..(2012) and Science - [https://dl.dropboxusercontent.com/u/3011470/Publications/Science-2013-Hsiang-science.1235367.pdf](https://outlook.leedsmet.ac.uk/owa/redir.aspx?C=sJyUBvXJT0-wqSf3hp3uzpRynDn_ctAIfLqX5ub_657bu5cPuh0P95ws3wF0xVTHIruulQLmvFw.&URL=https%3a%2f%2fdl.dropboxusercontent.com%2fu%2f3011470%2fPublications%2fScience-2013-Hsiang-science.1235367.pdf) [↑](#footnote-ref-7)
8. See Wright, 1998, & Omega Foundation 2000, for a detailed analysis and examples of proliferation and abuse. [↑](#footnote-ref-8)
9. [http://www.bo.cnr.it/www-sciresp/OLD/GdL/Genova/crowd\_control\_STOA\_annex.pdf](https://outlook.leedsmet.ac.uk/owa/redir.aspx?C=o38_fG7ArEeJg2JYithB_7gJIuomdtAIRpv4B2qZEbRIKESYfqk7avRWKeQv4auBaMhVYubLQY4.&URL=http%3a%2f%2fwww.bo.cnr.it%2fwww-sciresp%2fOLD%2fGdL%2fGenova%2fcrowd_control_STOA_annex.pdf) [↑](#footnote-ref-9)
10. <http://jnlwp.defense.gov/> [↑](#footnote-ref-10)
11. See <http://www.bbc.co.uk/news/technology-16415007> [↑](#footnote-ref-11)
12. <http://publicintelligence.net/> [↑](#footnote-ref-12)
13. See Bradford peace Studies Non-Lethal Weapons reports, <http://www.brad.ac.uk/acad/nlw/> [↑](#footnote-ref-13)
14. <http://www.ict.fraunhofer.de/de/veranstaltungen_messen0/veranstaltungen/nlw.html> [↑](#footnote-ref-14)
15. <http://jnlwp.defense.gov/future/ADT.html> [↑](#footnote-ref-15)
16. Silent Guardian SG-R50: [http://www.atmarine.fi/ckfinder/userfiles/files/Silent%20Guardian%20SG-R50.pdf](https://outlook.leedsmet.ac.uk/owa/redir.aspx?C=FpxFCHY57EKrbBAcjqSmFSdJrYgNZ9AI7yDG05RYVJpHi-gvCnitOutuMjYnwD5s2aCtVFjOeq8.&URL=http%3a%2f%2fwww.atmarine.fi%2fckfinder%2fuserfiles%2ffiles%2fSilent%2520Guardian%2520SG-R50.pdf) [↑](#footnote-ref-16)
17. <http://www.youtube.com/watch?v=9bzTJbMBuxk> [↑](#footnote-ref-17)
18. For a discussion, see Wright (2007a) [↑](#footnote-ref-18)
19. http://mondediplo.com/2007/08/12bioweapons [↑](#footnote-ref-19)
20. See Dando, 2002, in Lewer, 2002 [↑](#footnote-ref-20)
21. See BBC News, ‘Morocco flies out dumped migrants,’ 10 oct 2005, <http://newsbbc.co.uk/2/hi/africa/4326670.stm> [↑](#footnote-ref-21)
22. <http://www.bbc.co.uk/news/world-asia-23358329> [↑](#footnote-ref-22)
23. <http://www.geneva-academy.ch/docs/projets/Non-Kinetic-EnergyOctober2010.pdf> [↑](#footnote-ref-23)
24. <https://witness.theguardian.com/assignment/51f7a7c5e4b0472f65d02668?INTCMP=mic_2781> [↑](#footnote-ref-24)
25. Defence News 1 July 2009 [↑](#footnote-ref-25)
26. BBC, 21 September 2006. [↑](#footnote-ref-26)
27. http://news.bbc.co.uk/1/hi/scotland/1937048.stm [↑](#footnote-ref-27)
28. These sections draw extensively from Humble, T 2011 [↑](#footnote-ref-28)
29. Sources for the individual cases of border security can be found in Humble, ibid.. [↑](#footnote-ref-29)
30. Finmeccanica is an Italian-based company that manufactures aerospace, defence and security technologies. See: Finmeccanica (2012). [↑](#footnote-ref-30)
31. EADS Defence and Security is a European- based, internationally operating thats works in security and aerospace technologies. See CTW (2012) [↑](#footnote-ref-31)
32. <http://www.theguardian.com/world/prism> [↑](#footnote-ref-32)
33. <http://www.theguardian.com/uk/2011/oct/30/metropolitan-police-mobile-phone-surveillance> [↑](#footnote-ref-33)
34. <http://www.theguardian.com/world/2013/aug/12/city-london-corporation-spy-bins> [↑](#footnote-ref-34)
35. See Doyle, 2012 [↑](#footnote-ref-35)
36. http://icrac.net/ [↑](#footnote-ref-36)
37. <http://news.cnet.com/8301-17938_105-20010533-1.html> [↑](#footnote-ref-37)
38. <http://www.theregister.co.uk/2003/04/11/the_selfhealing_selfhopping_landmine/> [↑](#footnote-ref-38)
39. <http://www.ideaconnection.com/newinventions/metal-storm-virtual-minefield-03248.html>. [↑](#footnote-ref-39)
40. <http://www.newscientist.com/blogs/shortsharpscience/2008/10/packs-of-robots-will-hunt-down.html> [↑](#footnote-ref-40)
41. <http://www.slate.com/blogs/future_tense/2013/07/03/documents_show_customs_and_border_protection_considered_weaponized_domestic.html>
  [↑](#footnote-ref-41)
42. [http://www.atmarine.fi/ckfinder/userfiles/files/Silent%20Guardian%20SG-R50.pdf](https://outlook.leedsmet.ac.uk/owa/redir.aspx?C=FpxFCHY57EKrbBAcjqSmFSdJrYgNZ9AI7yDG05RYVJpHi-gvCnitOutuMjYnwD5s2aCtVFjOeq8.&URL=http%3a%2f%2fwww.atmarine.fi%2fckfinder%2fuserfiles%2ffiles%2fSilent%2520Guardian%2520SG-R50.pdf) [↑](#footnote-ref-42)
43. <http://www.theguardian.com/commentisfree/2013/sep/02/eu-ignoring-rights-abuses-morocco> [↑](#footnote-ref-43)
44. [http://halshs.archives-ouvertes.fr/docs/00/73/63/29/PDF/An\_Undocumented\_border\_economy.pdf](https://outlook.leedsmet.ac.uk/owa/redir.aspx?C=phkkg-SksEeux1mcyUgk_Fzf8Pc1h9AI4_ZCmr9HOcpeuuy2VyL7--jVrBTaNyR-xl8hswqkkdk.&URL=http%3a%2f%2fhalshs.archives-ouvertes.fr%2fdocs%2f00%2f73%2f63%2f29%2fPDF%2fAn_Undocumented_border_economy.pdf) [↑](#footnote-ref-44)
45. <http://www.theguardian.com/science/2013/sep/11/astronomer-royal-global-warming-lord-rees> [↑](#footnote-ref-45)
46. http://www.theguardian.com/environment/graphic/2012/jul/17/geoengineering-world-map [↑](#footnote-ref-46)
47. <http://www.bbm.cfnt3.de/index.cfm?id=1164&as=14237&ln=uk> [↑](#footnote-ref-47)
48. <http://news.cnet.com/8301-17938_105-57586858-1/killer-robots-may-wage-mechanical-slaughter-u.n-warns/> [↑](#footnote-ref-48)