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Autonomous Weapons and Border Security in the Era of Climate Breakdown

Kyle Volpi Hiebert

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About the Author

Kyle Volpi Hiebert is a Digital Policy Hub visiting fellow and a researcher and independent political risk analyst focused on globalization, conflict and emerging technologies. Based in Montreal, Canada, he is a consultant for the African Futures initiative at the Institute for Security Studies and was formerly based in South Africa as deputy editor of the *Africa Conflict Monitor*, a monthly digital report dissecting the causes and effects of war, terrorism and unrest across the continent.

Kyle's work has also been published in or by *Newsweek, The Walrus, CBC News, The Hill, Computer Weekly, Toronto Star, Middle East Eye,* the Canadian Global Affairs Institute*, Política Exterior* and elsewhere.

67 Erb Street West
Waterloo, ON, Canada N2L 6C2
cigionline.org

Policy Memo

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Bottom Line Up Front

A renewed global arms race is accelerating private sector–driven innovation around lethal autonomous weapons systems (LAWS), sometimes referred to as "killer robots." Unfolding in parallel are complex and intertwined dynamics tied to a surge in geopolitical hostility, mass migration and ecological collapse. The convergence of these factors is intensifying concerns around how to safeguard national sovereignty. One possible outcome is that states harness LAWS for border enforcement, prompting scenarios where individuals are targeted, rightly or wrongly, and subject to a potentially deadly attack by intelligent weapons, accidentally or on purpose, all under the guise of national security. Key to avoiding this will be forcing transparency around the use of LAWS in border operations. Policy makers must also collaborate on better forecasting and preparing for how climate change will alter regional and global migration patterns.

Key Points

- A new global arms race combined with huge leaps in robotics and machine learning has accelerated the evolution and adoption of LAWS. Yet consensus on how to govern their use remains deeply fractured.
- Climate change will trigger cascading security risks and mass displacement — just as nationalist populist movements increasingly shape foreign policy and pressure governments to strengthen border security measures.
- States may deploy LAWS in border regions under the cover of militarized rhetoric, insisting national security justifies circumventing rules governing the use of force.
- Governments should push for the responsible use of intelligent weapons to also apply to hybrid contexts, such as border security, while working to better understand how climate change will turbocharge irregular migration.

Recommendations

- **Middle powers that endorse the Responsible AI in the Military Domain (REAIM) Blueprint for Action (adopted in September 2024 by 61 countries at the second REAIM summit in Seoul) should work to extend its principles into hybrid contexts, such as border security.** The framework represents the most well-rounded platform available for non-military powers to promote best practices around the use of LAWS. However, as previously distinct areas of national security and defence increasingly converge due to changing domestic politics and geopolitical risks, REAIM principles should be applied to security domains that overlap with civilian functions outside of armed conflict.
- **Governments should work with experts and stakeholders in civil society, media and academic research institutes to monitor and report on autonomous weapons systems at borders.** This can indirectly help ensure systems' compliance with legally non-binding but agreed-upon standards.
- **States, multilateral agencies and non-governmental stakeholders should harness new technology to better understand how more intense climate change could alter regional and international migration outlooks.** This could include using artificial intelligence for predictive tools to map climate displacement and to identify and dismantle human trafficking and migrant smuggling networks.

Introduction

The world has entered a deeply uncertain era. The decline of America's post–Cold War hegemony and renewed great-power hostility is prompting a refocus on hard power, while also eroding norms around its use. Armed conflict is surging while climate change intensifies. And populist movements in wealthy countries are demanding curbs to immigration and humanitarian aid flows. Caught in the middle are tens of millions of people from the Global South. Some of them seek to escape war, climate fallout, poverty and dictatorship through irregular migration to the developed world.

None of these dynamics will recede anytime soon. They also could get much worse.

Envision the year 2040, based on current trajectories. A collective failure to decarbonize means global warming levels have soared past the target threshold of two degrees Celsius (*The Economist* 2021). New and unpredictable crises arise constantly, stemming from the destruction of rural livelihoods, food insecurity, resource disputes between neighbouring countries, mass population displacement and intercommunal fighting (Guy et al. 2020). More than 60 nations can no longer cope with extreme weather hazards (UN High Commissioner for Refugees 2025). Three-quarters of humanity grapples with severe water shortages as the world has become "water bankrupt" (UN University Institute for Water, Environment and Health 2026).

The nations hardest hit are concentrated in Sub-Saharan Africa and South Asia. They are also home to the fastest growing populations and the majority of the world's youth (United Nations Children's Fund 2024). Hundreds of millions of people across the two regions experience worsening poverty, compounded by infrastructure damage and reduced state capacity (Birkmann et al. 2023). Deep labour deficits in aging societies in East Asia, Europe and North America are a strong pull factor for young adults seeking to emigrate (Cilliers 2024).

Meanwhile, a former UN humanitarian chief's prediction from decades ago that Africa's restive Sahel region represented a "canary in the coalmine of our warming planet" (quoted in Burke 2020) comes true. Terrorist organizations, militant extremist groups and transnational criminal enterprises find safe havens in climate dead zones abandoned by the state. They entrench themselves in marginalized rural areas by filling governance vacuums, providing protection, supplying basic civil administration and organizing illicit economies (Ani 2025). Their presence and activity scare off foreign investment and paralyze nation-building initiatives, further motivating desperate citizens to flee abroad — often by paying human smugglers for help.

Yet climate change has emboldened authoritarian populist movements in democracies by draining resources, forcibly mixing communities and depleting government supports (Newkirk 2025). One-time fringe ideas around "eco-bordering" first promoted by far-right groups in the early 2020s (Turner and Bailey 2022) have gone mainstream across the West. The ideology — that halting new arrivals is necessary to preserve domestic ecosystems — is widely debunked by experts. Still, elected ethnonationalist parties secure a popular mandate to seal their countries off from immigration.

The post–Cold War liberal rules-based international order is also mostly defunct (Bekkevold 2025). Its terminal decline began with Russia's full-scale invasion of Ukraine

in February 2022. Although major institutional penalties are levied against Moscow for violating another state's sovereignty (Hathaway 2023), they do little to rein in fighting and prevent atrocities against civilians. This loss of legitimacy is accelerated by Israel's war on Gaza (Office of the UN High Commissioner for Human Rights 2025), and by global indifference to Sudan's anarchic civil war (Applebaum 2025; Bremmer, Ero and Ward 2025). Meanwhile, illiberal leaders successfully tilt the global balance of power in favour of autocracy as the collaboration and pooling of resources by authoritarian states embolden aspiring strongmen in nominal democracies elsewhere (Cheeseman, Bianchi and Cyr 2025; Human Rights Watch 2026).

But the second Trump presidency represents the death knell for post–Cold War globalization (Bremmer 2025; Carter 2026; Sanger et al. 2026; Kagan 2026; World Economic Forum 2026). The United States annexes Greenland by declaration in a bloodless coup in 2028 (Shapiro 2026; Shuster 2026). Doing so convinces America's allies and adversaries alike that Washington will no longer honour its commitments. Beijing seizes the chance to try to capture Taiwan (US Department of War 2025; Power 2026). A flurry of predatory land grabs ensues, spurred on by climate change altering geographical demarcations between nations and inciting dire water scarcity (Schwartzstein 2025; Kraft and Ganter 2026).

Rather than one imperfect international order, the world has devolved into multiple regional disorders (Zakaria 2026). Global military spending skyrockets, eclipsing $6.6 trillion by 2035 — more than double the levels of just a decade earlier (UN Secretary-General 2025). Much of this is funnelled toward lethal autonomous weapons systems (LAWS) built using propriety algorithms and hardware originating from the private sector. Powered by artificial intelligence (AI), these weapons, sometimes called "killer robots" — drone swarms, automated sentry towers, self-driving attack vehicles, uncrewed aircraft and submersibles, robot dogs, android soldiers and more — have all become widespread and affordable. However, international consensus on regulating their use remains splintered.

Fearing the spectre of military threats to their sovereignty and mass migration due to climate change, populist governments and their nativist supporters embrace a fortress mentality. Emulating the second Trump administration — when senior White House aides asserted creative legal interpretations of the Alien Enemies Act of 1798 to conflate immigration with a foreign invasion (Miroff and Lemire 2025; Xu 2026) — various countries militarize law enforcement and border control operations to police the flows of goods and people. Illegal border crossings by migrants are reclassified in government policy and rhetoric as national security threats that justify the use of force. And in a hotter, more dangerous world, LAWS — expendable machines immune to fear, heat, hunger and exhaustion — become the ideal watchmen.

The dystopian scenario painted above is not destined, but it is plausible.

This working paper thus seeks to test assumptions regarding autonomous weapons by offering grounded predictions as to what extent, and in what forms, this technology might be repurposed for border security in a world destabilized by climate change. The paper includes evidence of how governments are deliberately blurring distinctions between the historically separate policy domains of national defence and border security, elevating the chances for misuse of autonomous weapons.

National Security Redefined

Ethnonationalist movements are already imprinting their anti-immigrant views on states' foreign policy (Cliffe et al. 2025). One consequence is that authoritarian populist leaders are seeking to deter irregular migration by restricting ports of entry and securing border regions through overt militarization — at the southern US border, for example, but also in the central Mediterranean Sea, along the perimeters of the West Bank and Gaza Strip, and elsewhere.

To clamp down on illegal border crossings, the second Trump administration has reinstated a militarized zone along its southern border with Mexico, an ally and top trading partner. And legislation passed by a Republican-controlled Congress in 2025 allocates billions of dollars for autonomous border security technologies (Biddle 2025a). The major beneficiary is California-based defence tech firm Anduril, a builder of battlespace intelligence software and unmanned systems. The US Border Patrol agency has solicited Google and other US tech companies for sophisticated hardware and software solutions, including advanced drones (Biddle 2025b), despite America facing no threat of military assault from either the Mexican government or Mexican drug cartels. The technologies involved so far use autonomous capabilities for navigation and data gathering — not for targeting or attacks. However, the Pentagon's Maven Smart System, used for mass target identification and strike execution by US forces in Iran in March 2026, was reportedly refined in part through earlier tracking of migrant activity around the southern US border region (Manson 2026).

According to an anonymous source consulted for this paper,[1] it is important to identify how the weapons systems themselves apply autonomy. Some use autonomy for guidance; others for intelligence, surveillance and reconnaissance (ISR); and still others for target acquisition and elimination. According to that source, an ex-official, the real advantage of autonomous weapons systems are their fusing together of different strands of data and intelligence related to fast-moving objects, which means they can better handle an approaching threat than a human who has no time to make an informed decision. Migration, on the other hand, is a slow-moving problem, the source said — implying it was not a good fit for LAWS use. This former official also stressed that persons walking toward safe haven are not valid military targets. Lethal targeting of unarmed civilians would be a war crime.

This may all be true. However, political crises and partisan agendas prompt policy changes all the time. The presence of autonomous systems in one form also sets the stage for escalation to another.

Published in early December 2025, the second Trump administration's National Security Strategy (NSS) calls for military assets to control population movement (The White House 2025). The document vows to enlist the US Coast Guard and Navy to "thwart illegal and other unwanted migration," as well as combat human trafficking and control key maritime transit routes (ibid., 16). It also states the United States must be protected "not just from unchecked migration but from cross-border threats such as terrorism,

1 Interview conducted by the author with a former senior US defence official, November 6, 2025. The interview was conducted in confidentiality, and the interviewee's name is withheld by mutual agreement.

drugs, espionage and human trafficking" (ibid., 11). These statements effectively lump these dynamics together as equal threats to national security.

Shortly after the NSS was released, the Trump administration announced it would be extending the militarized zone to encompass added portions of the California-Mexico border. High levels of irregular migration were explicitly cited as motivation to transfer jurisdictional control over the territory from the Department of the Interior to the US Navy (Associated Press 2025).

But America is not alone in reaching for military tactics and technologies to wall itself off from unwanted foreigners.

After Europe's 2015 Migrant Crisis, front-line member states and the European Border and Coast Guard Agency invested heavily in aerial surveillance drones, AI lie detectors in processing centres and sound cannons in the eastern Mediterranean (Ahmed and Tondo 2021). Refugee camps in Greece have since become laboratories for AI surveillance technology that may violate European data protection laws (Emmanouilidou 2025). Research by scholar Alice Fill (2025) details numerous emerging, legally murky practices of "digital patrolling" — enforcing continental borders from afar using drones and remote monitoring systems.

Israel, India, China and Türkiye have also already adopted autonomous systems within their border defences to aid with logistics and ISR (see, respectively, Bernstein and Jeffery 2021; Agence France-Presse 2021; Chowdhury 2021; *Daily Sabah* 2019). In November 2025, a Shenzhen-based company received a US$37 million contract to trial using its humanoid robots to assist with crowd management and patrols at a Chinese border crossing with Vietnam (*The Straits Times* 2025). A US company, Foundation, has been discussing use of its humanoid soldiers in border patrol operations with the US Department of Homeland Security (Campbell 2026).

Again, none of these tools rises to the level of militarized use of force against migrants. And the targeting of individuals within border security operations is banned by the Geneva Convention. But states may increasingly feel justified to circumvent international law if irregular migrant flows grow large enough to destabilize border communities and stoke public disorder.

In January 2022, for example, Britain's Conservative government floated the idea of tasking the Royal Navy with deterring migrant dinghies from crossing the English Channel from France (Syal and Sabbagh 2022). The European Union has previously funded and outfitted abusive paramilitary forces in Sudan and Niger and militia-controlled coast guard groups in Libya to suppress movement via migrant gateways in Sub-Saharan Africa, leading to countless disappearances and deaths (Baldo 2017; Marsi 2022). Saudi border agents are alleged to have killed hundreds of Ethiopian migrants in recent years on the doorstep of the Gulf kingdom (Hardman 2023).

"The militarization of borders thrives in spaces where accountability is weakest," says Petra Molnar, a lawyer and anthropologist specializing in migration and human rights at York University.[2] Borders themselves, she argues, are legal grey zones — places where

2 Interview with author, November 12, 2025.

human rights law, refugee law and domestic regulations are selectively ignored and where "opaque decision making reigns supreme." Around the world, Molnar says, the absence of binding international rules on autonomous systems and border technologies more broadly, as well as the lack of transparency from both governments and private contractors, "creates the perfect environment for militarized technologies to creep into everyday border practices."

Indeed, despite the extensive amount of legal obligations enshrined in global treaties, the international system rests on norms more so than on concrete, well-enforced rules (Rachman 2025; Staley 2026). And the acceptability of government actions can be shaped and defined as much by effective propaganda as by legal precedent and credibility (Martina 2025). For example, torture is explicitly prohibited by the Geneva Convention. Yet, after the Central Intelligence Agency rebranded various methods as "enhanced interrogation techniques," they became central to America's Global War on Terrorism campaign (Amnesty International 2008; Luban and Newell 2019). That international rules are applied selectively and hypocritically has long been felt by populations in the Global South (Little 2026; Spektor 2026).

Further blows to the architecture of global governance have come in early 2026.

In January, the White House withdrew America from dozens of international conventions (The White House 2026). President Donald Trump also ordered the US military to abduct Venezuela's leader Nicolás Maduro and his wife in an overnight raid in Caracas. International legal experts denounced the operation as a clear violation of the UN Charter (Maupas 2026). However, the US Department of Justice issued a memo to justify it as a law enforcement operation given a New York court levelled drug and weapons charges against Maduro *in absentia* in 2020 (Savage 2026). The Trump administration afterward declared it would "run the country" on an open-ended basis under the threat of further military action (Hirsh 2026; CNN 2026). America's leader then pushed the North Atlantic Treaty Organization alliance to the brink over threats to take Greenland by force. Weeks later, the United States and Israel jointly launched a fresh war against Iran. Tehran responded by closing the Strait of Hormuz, a waterway vital to the global economy.

"It is not just the existing international legal system that is in jeopardy now," wrote two prominent Yale Law School professors after Maduro was captured (Hathaway and Shapiro 2026). "At risk is the survival of any rules at all — and with them any constraints on the exercise of state power."

The Global Military Industrial Complex Evolves

A hollowing out of the rules-based liberal international order is also overlapping with how new AI-powered weapons are revolutionizing armed conflict (Milley and Schmidt 2024).

Indeed, during the early twenty-first century, humanitarian laws have been challenged repeatedly by advances in military technology (Matthews and Lamensch 2025). This is perhaps most true around enforcing accountability, proportionality and

non-discrimination in the use of force, as computers and machines play an ever-larger role in decision-making processes and kinetic operations (ibid.). Recent history suggests such tools could eventually get repurposed for law enforcement and border operations (Barrett 2020; Winston 2026).

Arms control campaigners, civil society groups and dozens of smaller countries insist strict international rules are necessary to curb the proliferation and abuse of LAWS (Docherty 2025), including a ban on fully autonomous design models. In November 2023, the UN General Assembly adopted its inaugural resolution "to address the challenges and concerns" raised by autonomous weapons in a landslide vote (see Table 1).

But some experts, including Michael C. Horowitz (2025), argue that the concept of humans being "in," "on" or "out" of a weapon system's design loop is unhelpful. It implies an unreal standard of continuous human oversight unapplicable to even conventional weapons. From this view, so long as sound human judgment around their creation, testing and deployment is demonstrated, killer robots operating solely on the basis of programming, sensor input and algorithmic decision making could still meet current legal and normative definitions of keeping military AI under responsible human control.

This position is reflected within the US State Department's Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy (US Department of State 2024). As of November 27, 2024, it had been endorsed by the United States and 57 other countries.

The reality is that the technology and potential uses for killer robots are also simply multiplying and progressing too fast to hope for a moratorium (Volpi Hiebert 2022). Ukraine's defence against Russian invaders has already been distilled down to mostly drone-centric combat using AI-powered units capable of killing without oversight (Hambling 2023). Ukraine's President Volodymyr Zelenskyy told the 2025 UN General Assembly that machines independently targeting and killing combatants is inevitable (Zelenskyy 2025).

Table 1: National Positions on Autonomous Weapon Regulation

In Favour	Opposed	Abstaining
164 nations comprising small and middle powers — but also the United States under the Biden administration	Belarus India Mali Niger Russia	China North Korea Iran Israel Saudi Arabia Syria Türkiye United Arab Emirates

Source: Jones (2023).
Notes: Categories reflect the outcome of the first UN General Assembly vote on the issue via draft resolution L.56 (UN General Assembly 2023) in November 2023. The resolution emphasized "the urgent need for the international community to address the challenges and concerns raised by autonomous weapons systems."

Autonomous weapons are poised to spread to less militarily advanced nations, too, such as in Africa (Volpi Hiebert 2025). The continent remains reliant on foreign security assistance and external arms suppliers. Many of these military benefactors — China, India, Russia, Türkiye and the United States among them — are nations deeply committed to developing LAWS. The Kremlin, for one, has military-technical cooperation agreements with more than 40 African countries (Interfax 2023). Moscow also has expansive business networks and military expertise on the ground in the form of its Africa Corps (Minde 2024). It thus seems likely that Russian arms sales to Africa could eventually include advanced drone technology.

"Future wars will no longer be about who can mass the most people or field the best jets, ships, and tanks," argue Mark A. Milley and Eric Schmidt (2024). Milley, a former US military chief, and Schmidt, the ex-CEO and chair of Google turned defence tech investor, say that "instead, they will be dominated by increasingly autonomous weapons systems and powerful algorithms" (ibid.).

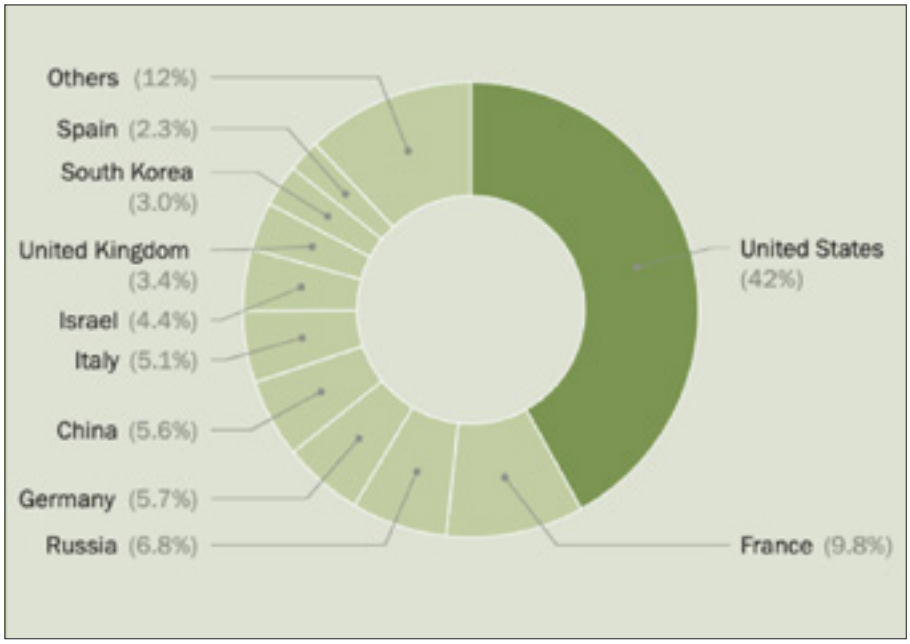
These developments are attracting deep interest from Western venture capital groups. According to Dutch market research firm Dealroom.co, the share of defence tech within overall European venture capital funding was 6.2 percent in 2024 — up from less than one percent before 2020 (Olson 2025). In the United States alone, defence tech start-ups had received more than US$100 billion in investment as of late 2023 (Somerville 2024).

Meanwhile, regulatory and investment shifts are under way to channel private capital flows toward dual-use technologies — tools with both civil and military applications. In particular, Russia's full-scale invasion of Ukraine provoked a tectonic shift in mindset among Western money managers. Even some portfolios and institutional investors emphasizing environmental, social and governance standards no longer consider arms companies taboo. In March 2025, more than 100 members of Parliament from Britain's left-leaning Labour government signed a letter saying that banks, investors and pension funds should treat weapons manufacturers as "ethical investment[s]" (Jolly 2025).

Thus, aside from national security concerns, nations are viewing rearmament as an engine for economic growth. Defence tech companies are already resurrecting Rust Belt cities in America (Frenkel 2025). Likewise, President Vladimir Putin's war machine has in essence become the basis for the entire Russian economy (*Bloomberg News* 2025). Putin has said he wants his country to boost arms exports to offset how sanctions and tepid oil prices are straining state coffers (Reuters 2025). Ukraine has launched co-production of military drones with its European allies to unlock funding for its domestic arms industry (Hunder 2026). China's list of foreign military clients is also growing. Likewise for Türkiye, which UN experts claim trialled the world's first fully autonomous armed drone in Libya in early 2020, to hunt down rebel fighters retreating into the desert outside Tripoli (UN Security Council 2021). Senior Turkish officials say Ankara now controls roughly two-thirds of the global military drone market (*Daily Sabah* 2024).

According to data from the Stockholm International Peace Research Institute, 66 states were classified as major arms suppliers from 2021 to 2025 (George et al. 2026, 2; see also Figure 1). During that time, global volume of arms transfers jumped 9.2 percent compared to the previous five-year period (George et al. 2026, 1).

Figure 1: Top Global Arms Exporters, 2021–2025



Data source: Adapted from Figure 2, George et al. (2026), which contextualizes data from the SIPRI Arms Transfer Database.

Some arms industry insiders have thus cautioned about a looming investment bubble, especially around unmanned aerial systems (Bryant 2025). If this materializes, even temporarily, it may convince defence tech companies — and their investors and lobbyists — to push for other enduring uses for them. This happened in late 2025 as the US military started bombing alleged drug-smuggling boats in the Caribbean and eastern Pacific. Once it became clear that counter-narcotics operations would feature in Trump's second term, media reports detailed how defence tech companies that had been focused on the battlefields of Ukraine swiftly rebranded their products and services as vital to the new war on drugs (Somerville and Bergengruen 2025).

Elke Schwarz (2025) warns that the profit motive of venture capital groups risks exerting further undue influence on LAWS development and deployment. She argues that defence technology companies are distorting policies, dynamics, norms and discourse around LAWS in anti-democratic ways. In response to a request for comment, Schwarz noted there is an inherent tension between defence tech start-ups seeking to score high returns and scale quickly, and the need for regulation to prevent harms from their products being misused and abused.[3] "Traditionally, venture capital firms have lobbied for less regulation and more latitude in experimentation," she said.[4]

As threats to national sovereignty mount and ethnonationalist movements and law makers advocate for a severe crackdown on immigration, defence tech companies will likely see openings to market their products within border security operations. Yet experts warn that move would risk streamlining the abusive use of force (Burt and Frew 2020).

3 Elke Schwarz, email message to author, December 4, 2025.

4 Ibid.

"We have already seen targeted assassinations using drones conducted by the US, the UK and Israel against individuals designated as so-called terrorists," says Dr. Peter Burt, a researcher for Drone Wars UK.[5] "By exploiting a legal grey zone over the definitions of war and combatants, these states have engineered a situation where they can execute suspects deemed to pose a threat from afar without evidence or trial." Burt also points out how criticism of these actions is rebutted with unsubstantiated claims about threats to the public posed by such individuals. "We have seen exactly the same thing in the Caribbean where the Trump administration has conducted extra-judicial assassinations of alleged drug traffickers with no legal basis for its actions."[6]

As of May 31, 2026, at least 205 people have been killed since September 2025 in dozens of US military attacks on alleged drug-trafficking vessels in the Caribbean and eastern Pacific Ocean (Gamio, Rosenberg and Savage 2026).

When it comes to autonomous weapons usage, countries are likely to prioritize their own interests above international accords. Several Baltic states have exited the Ottawa Convention, the global anti-landmine treaty, in case they need to lace their borders with explosives as a deterrent against future Russian aggression (*The Economist* 2025). In November 2024, the same four nations — Estonia, Poland, Latvia and Lithuania, along with Ukraine — abstained from voting on a second UN General Assembly resolution to rein in autonomous weapons (Jones 2024). The second Trump administration's NSS also endorses the idea that states' self-ascribed national interests transcend international laws and treaties.

All of these dynamics will be tested further by the mass displacement of populations due to climate change — especially absent an agreement on how to handle them.

Climate Disruption Looms Large

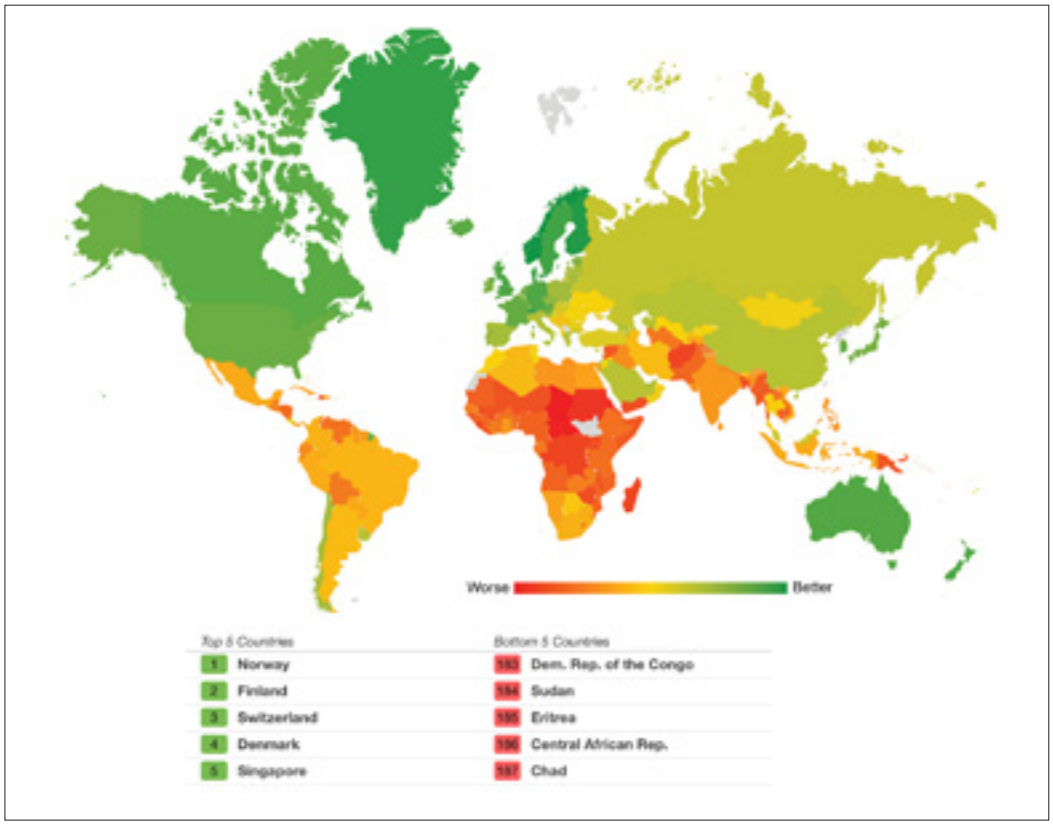
While climate change is rarely cited by migrants as the main reason they leave home, its effects aggravate other aspects of deprivation (Huang 2023). It is already an invisible driver of population movement and will become an even greater factor in coming decades. The World Bank (Clement et al. 2021) forecasts that climate change could force between 44 million and 216 million people to newly migrate within their own countries by 2050, mostly in Sub-Saharan Africa, Asia and the Pacific. Other experts predict the effects of extreme weather volatility could displace as many as 1.2 billion people globally by mid-century (Henley 2020), although this number is often disputed based on critiques that the methodology used to reach that figure does not differentiate between short-term and permanent displacement (Huang 2023). What is more, the UN High Commissioner for Refugees (2025) reports that as of mid-2025, three-quarters of the 117 million people displaced by war, violence and persecution lived in countries most exposed to climate-related hazards. Figure 2 illustrates the top five and bottom five countries' vulnerabilities to climate change and related challenges, ranked alongside their readiness to improve resilience, using data as of June 2025 from the Notre Dame University Global Adaptation Initiative (ND-GAIN) Country Index.[7]

5 Interview with author, November 12, 2025.

6 Ibid.

7 See https://gain.nd.edu/our-work/country-index/.

Figure 2: ND-GAIN Country Index Scores (June 2025)



Data source: ND-GAIN Country Index (https://gain.nd.edu/our-work/country-index/).

In the future, if even a small fraction of those displaced by climate change were to decide to journey to the Global North and reached their desired destination, it would still total millions more illegal border crossings each year. Terrorist groups and criminal enterprises would also pivot toward human smuggling as a thriving source of revenue. This might be enough for law makers in advanced economies to call for radical solutions. Negative public opinions in destination countries could be amplified as well by stories of migrant caravans clashing with local law enforcement. This already occurs at times on well-trodden pathways throughout Latin America (*BBC News* 2022).

Some state actors are also beginning to weaponize migration itself.

Since 2021, Russia and Belarus have collaborated on programs that have attracted thousands of Middle East migrants to their countries based on false promises of resettlement in Western Europe — only to dump the migrants at the borders of neighbouring Latvia, Lithuania and Poland (Ashurkevich 2025). The three Baltic countries have responded by invoking states of emergency and mobilizing armed soldiers to their borders. Each small nation is ill-equipped to receive irregular migrants given their ethnically homogenous populations and limited state welfare capacity.

Similarly, Niger's anti-Western junta government swiftly scrapped the country's migration deal with the European Union and decriminalized human smuggling after taking power in a coup in July 2023. Two years later, organized human smuggling networks had reanimated in the desert city

of Agadez (Adeleye 2025). The regional hub is a popular gateway for West African migrants seeking to reach Europe via the Mediterranean.

The co-founder of an Israeli defence tech firm that has received funding from US venture capital groups and the Central Intelligence Agency suggests the solution to a wide range of border issues is to build a truly autonomous protection system (Thornhill 2025). The concept involves weaving together a latticework of different sensors, drones and autonomous vehicles to alert military personnel to suspicious border activity after it is first evaluated by AI programs. No such system currently exists; the requisite technology to make one does.

Israeli authorities already use Palestinian territory as a testing ground for unregulated AI-driven systems, many of which are later exported globally (Loewenstein 2023). Petra Molnar, the lawyer and migration specialist at York University, notes that officials routinely describe automated towers, AI-assisted targeting systems and drones as "precision tools" that enhance safety. This, despite how she suggests they are actually used to control, intimidate and harm civilians.

"As climate change intensifies forced displacement, there is a real risk that states will turn to more autonomous and semi-autonomous military technologies as a quick, efficient, and violent substitute for humanitarian policy," Molnar says. "States typically frame these tools through the language of security and risk management, blurring the distinction between people on the move and armed threats." These semantics are powerful, she argues, in how they reclassify people fleeing violence or climate collapse as dangers and risks — thereby normalizing technologies under the guise of security that international law clearly restricts in civilian contexts.

Economic opportunity might alter the use case of new weapons technology in other problematic ways as well.

AI technologies such as facial recognition and movement pattern analysis rely heavily on algorithms that can sometimes produce errors, even in controlled test environments (Kori 2025; Probasco et al. 2025). In ambiguous real-life scenarios, the hasty adoption of autonomous weapons systems, faulty programming or automation bias — where operators trust computer-generated prompts over their own knowledge and evidence — might thus lead to the wrongful identification of individuals as threats (Hiebert 2024). Misidentification is particularly concerning in border areas where frequent civilian crossings occur (Kori 2025).

Targeting mistakes are already made by humans all the time. A civilian carrying a shovel can resemble a militant holding a rifle. A farmer carrying a rifle for self-defence or herd protection can mirror the image of a terrorist. The mass displacement and movement of people and stoking of conflict because of climate change will constantly generate new variables and contexts for algorithms to decipher. A refugee carrying a backpack of their belongings trying to sneak past a section of border wall while fleeing a natural disaster could be mistaken for a suicide bomber. A subsistence fisherman or pastoralist group forced to find new sources of water or grazing land in drought-affected areas could unwittingly cross state lines. Emergency relief efforts involving convoys of aid workers in vehicles transiting climate-devastated regions could be mistaken for human smugglers, drug traffickers or foreign military mobilization.

Introducing autonomous targeting capabilities into the mix — even for legitimate purposes such as asymmetric defence against invasion from a hostile neighbouring force — would further endanger innocent lives. The difference with the inclusion

of LAWS is that these targeting decisions would be made at an exponentially faster pace based on machine processing of opaque data points and sensor inputs — possibly to the point of exceeding human cognition and oversight (Hiebert 2024).

When it comes to mitigating the risks of LAWS, the Blueprint for Action adopted in September 2024 by 61 countries at the second summit for Responsible AI in the Military Domain (REAIM) in Seoul[8] provides arguably the most effective platform to work from. Its language embeds human rights and data protection principles into suggestions for how autonomous weapons should be used. A report from the Global Commission on REAIM (2025) ahead of the third summit highlights border security as critical context pertinent to the use of military AI, including LAWS, given it is a domain where military activity takes place. The report similarly urges policy makers to consider the broader impacts or uses of military AI applications beyond armed conflict.

However, only 35 of 85 participating countries signed REAIM's Pathways to Action agreement at its subsequent third summit held in Spain in February 2025 (Waldersee 2026). Notable absences included the United States, China, Israel, Russia and other regional powers.

Recommendations

States endorsing REAIM — in particular, middle powers — should work to extend the Blueprint for Action's principles into hybrid contexts involving civilian functions, such as border security. This could involve encouraging governments to publish case studies detailing their view of responsible use of autonomous weapons systems in border operations (Rosen 2024). It might also involve proposing time- or capability-based limitations on the autonomy of weapons systems in high-risk border contexts, for example, encouraging that the use of autonomous systems be restricted to navigation and ISR activities only, and excluded from threat identification and engagement, in areas with tense interstate relations or high cross-border traffic and mixed populations (Kori 2025, 11).

Governments should support experts and stakeholders in civil society and academic research institutes who undertake to monitor and report on autonomous weapons systems installed along borders during peacetime. These groups and individuals could create public registries to track such technologies, drawing upon information from satellite imagery, investigative reporting, civil society, non-governmental organizations, community-led networks and open-source intelligence, to foster accountability and encourage compliance with agreed-upon standards (West 2024).

Finally, there should be a push to understand how irregular migration and asylum-seeking trends will be altered as a result of more ferocious weather extremes. This work could include using AI for predictive tools to map climate displacement. AI-powered technology has proven promising in dismantling human trafficking networks (Balasubramanian 2025), as well as in strengthening transnational responses to migrant smuggling (Park-Burrows et al. 2025). Both activities are repeatedly held up by populist law makers as criminal methods of illegal migration that warrant the use of military force.

8 See https://dig.watch/resource/responsible-ai-in-the-military-domain-reaim-blueprint-for-action#REAIM_Blueprint_for_Action.

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