

No Monopoly Left: How Drone Warfare Escaped Its Architects

Delina Goxho

Something is becoming impossible to ignore: wherever you look today - the skies above eastern Ukraine, the Persian Gulf, the plains of Burkina Faso - drones are reshaping the logic of conflict. A technology that states in the Global North once claimed as their own exclusive, controlled, and supposedly “light” instrument of war has proliferated so fast, and in so many directions, that the comfortable assumptions that underpinned two decades of remote warfare doctrine are disintegrating.

Remote warfare means fighting at a distance - substituting boots on the ground for drones, proxies, and partner forces, and projecting violence while remaining insulated from its consequences. It became the dominant Western military mode after Iraq and Afghanistan: intervening without the political cost of body bags, keeping the footprint light, the cost low, and the operator safe. That calculus still drives states reaching for drones over boots on the ground. But the proliferation of cheap unmanned systems to non-state actors, and their mass adoption by states that previously had no access to this technology, has transformed remote warfare from a Western strategic advantage into a shared grammar of violence - one that its architects never intended to create.

UKRAINE CHANGED THE RULES OF DRONE WARFARE FOR EVERYONE

Ukraine is the laboratory in which drone warfare came fully of age, and that laboratory has been brutal for both Russia and Ukraine. What began as an adaptation - improvising FPV (first person view) drones against Russian armour when Western weapons arrived too slowly - has

become something far more consequential. Ukrainian domestic drone production is expected to reach [seven million units this year](#). Around [three-quarters](#) of Russian battlefield casualties are now inflicted by drones. The battlefield has been so fundamentally reconfigured that Russia no longer moves troops in large formations; instead, soldiers advance [in pairs or threes](#), attempting to stay beneath the eye of the sky.

But this is not a one-sided transformation. Ukrainians are equally in the crosshairs. Ukraine is currently hit with at least 100 drone strikes every day, one every 15 minutes. The toll on civilians has been severe: throughout 2024 and into 2025, short-range FPV drones became the [single deadliest weapon system](#) targeting Ukrainian civilians in frontline areas, with casualty numbers spiking sharply in the second half of the year. By April 2025, [verified data](#) showed nearly 400 civilians killed and over 2,600 wounded by short-range drone attacks since the full-scale invasion began - the overwhelming majority of them in Ukrainian-held territory, struck by Russian forces.

This also marks a qualitative rupture with everything that came before. The Western concept of drone warfare was forged in the post-9/11 era: a “light footprint” instrument, [delivering precision strikes](#) against selected, named targets in permissive airspace. Predators circling over Waziristan or Yemen, loitering for hours before a single Hellfire was released. What Ukraine has revealed is something categorically different. Drones in this conflict are not precision tools held in reserve for high-value targets; they are disposable, single-use munitions, churned out and expended at the same tempo as artillery shells, by two fully mobilised conventional armies grinding against

each other across a front of over a thousand kilometres. Monthly deliveries to Ukrainian forces alone now reach [200,000 units](#) - ten times the rate of just a year earlier. This is not the age of the precision strike. This is the age of drone saturation.

The strategic significance of this extends [far beyond the Donbas](#). Ukraine has become the world's most experienced practitioner of drone warfare at scale, and that expertise is already circulating. Ukrainian drone specialists are now working alongside American troops to help [protect US military bases in Jordan](#), and have deployed to Qatar, Saudi Arabia, and the UAE to assist in [coordinating air defences](#) against precisely the same Shahed drones - Iranian-designed, Iranian-exported - that [Russia has been deploying against Ukrainian cities](#) for two years. And in the Sahel, Ukrainian drone specialists are training FLA rebel fighters to counter Russian Wagner Group and Africa Corps in the north of Mali through [optic fibre drones](#). None of this is entirely without precedent. The Islamic State, at the height of its territorial control in Iraq and Syria, was [already experimenting](#) with this logic - repurposing cheap commercial quadcopters to drop grenades on coalition positions, using consumer FPV technology to conduct reconnaissance, and circulating tactical knowledge horizontally across a distributed, non-state network in ways that confounded a vastly better-equipped adversary. The anti-ISIS coalition spent years and considerable resources developing [counter-drone protocols](#) in response. What has changed is not the concept but the scale, the sophistication, and above all the speed of diffusion: what ISIS improvised under pressure, state militaries have now industrialised, and the knowledge flowing from Ukraine to the Sahel travels faster and further than anything the Mosul battlefield produced. The knowledge, the tactics, the counter-drone architecture: all of it is now in motion across multiple theatres simultaneously.

THE GULF: WHEN THE ECONOMICS TURN AGAINST THE DEFENDER

The Iranian campaign of drone and missile strikes across the Gulf that followed the US-Israeli strikes of late

February 2026 has brought the logic of drone saturation to the most energy-sensitive maritime zone on earth. The numbers are staggering. The UAE alone absorbed [the majority of recorded Iranian strikes](#) in the first week of March 2026 - over a thousand detected drones and hundreds of missiles. The arithmetic is simple and deliberately punishing: a [Shahed costs roughly \\$50,000](#) to build; the interceptor fired to kill it costs [dozens of times more](#). What Iran is waging is less a military campaign than a war of economic exhaustion - using precision strikes to raise the cost of regime change beyond what Washington and its allies are willing to pay, while systematically bleeding their air defences dry. The abstraction became concrete on 10 March, when an Iranian drone struck the [Ruwais Industrial Complex](#) in Abu Dhabi - home to the UAE's largest oil refinery, which at full capacity processes 922,000 barrels a day. Emirati oil giant ADNOC shut the facility down as a precautionary measure following the fire sparked by the strike, the latest in a series of attacks that had already forced the company to reduce operations at a second refinery unit by 10 to 20 percent since 6 March. That same week, ADNOC's chief executive Sultan Al Jaber described the pattern of strikes on energy infrastructure across the region as ["global economic warfare."](#) The interceptors had done their job on most incoming waves; the problem was that doing that job meant firing Patriot and THAAD missiles at a rate no stockpile is designed to sustain - and what got through was enough to shut a refinery processing nearly a million barrels a day and rattle the confidence of every sovereign wealth fund with assets in the emirate.

This is not a new strategy. It is the same logic that Russia applied over Ukraine, refined, and now applied at Gulf-state scale. The crucial difference is that where Russia used it against an adversary with scarce, donated air defences scrambling to survive, Iran is deploying it against some of the most heavily defended airspace on earth. Gulf states have spent decades and hundreds of billions of dollars assembling some of the most advanced layered air defence architectures in existence: Patriot batteries, THAAD systems, cutting-edge radar networks. And yet the arithmetic of attrition defeats them just the same, because the problem is not the quality of the shields. It is

the cost of using them. Intercepting a Shahed drone with a Patriot missile means spending roughly \$4 million to neutralise a target that cost its launcher around \$50,000 - and less than two days into the conflict, US media was already reporting concerns about potential shortages of interceptors. Here lies the core problem that collapses the “light footprint” assumption. That doctrine was built on a particular set of conditions: Western forces deploying precision air power against adversaries with negligible air defences (Predator drones over Afghanistan or Yemen), where the threat travelled in one direction only, and where the cost equation favoured the attacker by design. What the Gulf crisis makes unmistakably clear is that those conditions no longer hold: drones are no longer a Western monopoly deployed at will against defenceless targets, but a mass instrument available to any adversary willing to produce them at scale - and the economics of that reversal run entirely against the defender. For every dollar Iran spends launching drones, the states defending against them spend somewhere between twenty and six hundred dollars shooting them down, depending on which interceptor system is used. Precision was never the point. Volume was always the strategy.

If Ukraine industrialised drone warfare and the Gulf has shown that even the most heavily defended airspace in the world cannot hold it back at sustainable cost, Africa shows what it looks like when it arrives with no defences and no one to answer for the consequences. In 2024 alone, African conflicts recorded 484 drone strikes causing over 1,170 casualties across thirteen countries. Sudan and the Sahelian states accounted for 84% of those strikes. The story starts, as it often does, with a supply side. “Drone diplomacy” refers to the practice of quick-fire drone sales with minimal preconditions: a race among supplier states to purchase geopolitical influence, market share, and access to raw materials through the transfer of lethal aerial systems. Turkey has been the most aggressive player: Ankara (and its most prolific drone company Baykar) imposes no human rights conditions on its military sales to African states, which is a large part of why it has become so popular. A senior Malian officer put it bluntly: “with Turkey, we have a speed we don’t have elsewhere, not even in Russia or China”. China and Iran

have operated on similar terms: Beijing has long traded Wing Loong drones for African natural resources, while for Tehran, whose economy labours under sanctions, drone exports have become a critical source of both income and regional footprint. The result is a continent awash in armed unmanned systems, sold by states with little interest in how they are used once delivered.

SUDAN: THE CONVERGENCE OF COMPETING ARSENALS

Sudan has become perhaps the clearest and most devastating demonstration of where this leads. The civil war between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF), which erupted in April 2023, has turned into a multi-sided drone competition funded and supplied by rival external powers. The SAF has received Iranian Mohajer-6 combat drones via cargo flights to Port Sudan, Turkish Bayraktar TB2s channelled through Egypt, and Russian support - with Moscow reportedly switching allegiance from the RSF’s Wagner Group backers to the SAF in exchange for renewed access to a Red Sea naval base. The RSF, which has no air force of its own, has been equipped through a network of supply routes allegedly running through Chad and Libya, with the UAE as the principal backer, providing Chinese-manufactured kamikaze drones and Serbian-made mortar-dropping quadcopters.

The geography suits drone warfare brutally well. Sudan’s terrain offers almost no natural cover, making it highly conducive to aerial surveillance and strike. And the human cost has been catastrophic. ACLED data attributes at least 2,200 deaths to drone strikes since the conflict began, with 80% of those occurring in 2025 alone, a sharp acceleration reflecting both sides’ expanding arsenals and deepening reliance on unmanned systems. The targets have not been confined to anything resembling military objectives. In December 2024, the RSF carried out three drone strikes on a kindergarten and a hospital in Kalogi, South Kordofan, killing more than 114 people. RSF drones targeted displacement camps in El Fasher, including strikes on a shelter for internally displaced people that killed at least 57 civilians in a single attack, while both sides’

[drones](#) systematically struck markets, dams, electricity infrastructure, and hospitals. One humanitarian expert described the pattern with uncomfortable clarity: drones in Sudan have become, above all, “[a weapon of mass terror](#)”, cheap, easily launched from anywhere, and extraordinarily effective at projecting fear far beyond active front lines.

ETHIOPIA: WHEN THE SUPPLIER LOOKS AWAY

Ethiopia offers a different case, because here it is a recognised government deploying an imported drone arsenal against its own civilian population in multiple regions simultaneously. The Ethiopian military first used drones [during the Tigray war of 2020–2022](#), acquiring Turkish, Iranian, and Chinese systems at extraordinary speed. Between September and October 2021, open-source tracking recorded 51 suspicious cargo flights into Ethiopia (45 from the UAE, 6 from Iran), as the government launched its counter-offensive against Tigrayan forces. By the end of that year, Turkish defence exports to Ethiopia had reached [\\$60 million](#), compared to almost nothing the year before. A Turkish-made drone dropped precision-guided bombs on [a school compound in Dedebit](#) that had been converted into a displacement camp, killing at least 57 civilians - mostly older people, women and children sleeping in tents - in the early hours of 7 January 2022. The war spread. In the Amhara region alone, at least 669 people have been killed in more than 70 drone strikes since 2023, according to [ACLED data](#). The targeting has followed a consistent pattern: documented strikes have repeatedly hit marketplaces, clinics, ambulances, and schools. Between October 2023 and May 2024, 53 confirmed deadly strikes across 35 distinct incidents produced [433 civilian casualties](#). In the Amhara region alone, by late 2024, drone strikes had contributed to the closure of 4,000 schools and the deprivation of schooling for [four million children](#). The Ethiopian military denies targeting civilians. The evidence accumulates regardless.

What makes the Ethiopian case particularly corrosive is the international response — or rather, the near-total absence of one. When Turkish drone manufacturer Baykar’s CEO was awarded a [national honour](#) by Ethiopia’s

army chief for “[significant contributions to the capacity building of the Ethiopian air force](#),” there was no serious diplomatic rebuke from Ankara’s NATO partners. The West’s reticence owes much to geopolitics: Ethiopia is seen as a regional stabiliser, which tends to mute criticism of how it uses the weapons it acquires. This silence has its own lesson: the precision and accountability standards the West claims to attach to drone warfare evaporate almost entirely once the weapon is transferred.

THE SAHEL: TACTICS TRAVEL

In the Sahel, the picture is again different but connected. Here, drones are not just moving from state to state - they are moving sideways from state to non-state, from conventional armies to jihadist and rebel groups, and the tactical knowledge is crossing borders. Governments in Mali, Burkina Faso, and Niger have all acquired Turkish TB2s from their new military partners, deploying them in counter-insurgency campaigns with predictably indiscriminate results. Jama’at Nusrat al-Islam wal-Muslimin (JNIM), al-Qaeda’s regional affiliate and the Islamic State in West Africa Province (ISWAP) are [repurposing cheap Chinese-made commercial drones](#) for strikes - attaching IEDs, grenades, and small mortar shells - and using them for real-time intelligence in operational environments where state militaries previously held an overwhelming surveillance advantage. According to a [UN report to the Security Council](#) in February, ISWAP has been stockpiling drone systems by commercially importing spare parts and [reassembling them locally](#), accelerated by [offline AI tools](#) that help drones evade traditional detection and jamming. In Burkina Faso, JNIM launched a strike on Burkinabe military positions in February 2025, using FPV drones to drop explosives improvised from [plastic water bottles](#) - tactical knowledge acquired from watching both state forces and the Ukrainian battlefield.

The feedback loop between Ukraine and the Sahel, through Mali’s Azawad Liberation Front, is part of a wider pattern of horizontal tactical transfer that is genuinely new. What is being shared across these theatres is not hardware so much as doctrine - the understanding that a cheap drone with a camera, a consumer-grade FPV

headset, and a repurposed mortar shell can neutralise the battlefield advantage of a well-equipped conventional force. The spread of [fibre-optic FPV drones](#) from the Ukrainian front to Malian rebel fighters - a technology that is essentially immune to electronic jamming and nearly impossible to intercept by conventional means - is the clearest marker of how quickly this knowledge circulates once it is battlefield-proven.

THE ARCHITECTURE OF UNACCOUNTABILITY

What unifies all of this - Sudan, Ethiopia, the Sahel - is something that goes beyond any single conflict. Drones have been marketed to African governments as a modern, efficient instrument of war that reduces risk to their own soldiers. In practice, [research](#) consistently shows that their availability significantly [lowers the threshold](#) for the use of force: it becomes much easier to authorise a strike when no pilot is at risk, and the result has been a mounting civilian toll that no one is being held accountable for. Drone Wars UK documented at least 943 civilian deaths in over [50 verified incidents](#) across six African countries between November 2021 and November 2024 - and noted that this figure is almost certainly a significant undercount, because most of these campaigns are conducted under information blackouts.

The supply architecture makes accountability structurally impossible. Turkey sells with no conditions. China packages drones inside infrastructure deals and asks no questions. Iran trades missiles and UAVs for naval access and hard currency. The growing profits and diplomatic influence these states derive from drone sales ensure that they have every incentive to keep selling, and no incentive whatsoever to impose the kind of oversight that might interrupt the flow. Meanwhile, the [UN Arms Trade Treaty](#) - which requires states to regulate weapons sales to countries with poor human rights records - has proven wholly inadequate to the pace and informality of this market.

There is a final irony worth sitting with. The United States spent two decades constructing a legal and rhetorical architecture around drone warfare - targeted killing

programmes, signature strikes, elaborate justifications built around necessity and proportionality - that was always more about managing domestic politics than genuinely constraining the use of force. That architecture, fragile as it was, applied only to American drones. The proliferation of cheaply manufactured systems from Turkey, China, and Iran across the African continent has rendered that entire framework irrelevant. The technology has moved; the norms have not. What is happening in the skies over Darfur, the Amhara highlands, and the Sahel is what drone warfare looks like when it is finally, fully, democratised - available to any government, any militia, any rebel movement willing to find a supplier and pay the price.

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