Military Technological Evolution: How Drones are Redefining Conflicts in the Horn of Africa

Bravin Onditi

Abstract

Over the past decade, unmanned aerial vehicles (UAVs) commonly known as drones have evolved from niche surveillance instruments into decisive weapons of war. Their proliferation across the Horn of Africa and its immediate neighbourhood has introduced a new and deeply consequential variable into conflicts that are already among the world's most complex and deadly. This article examines how drone warfare is reshaping armed conflict in the region through four distinct but interrelated case studies: the Tigray war in Ethiopia, the ongoing campaign against al-Shabaab in Somalia, the armed conflict in the eastern Democratic Republic of Congo (DRC), and the civil war in Sudan. Drawing on publicly available evidence, field reporting, and open-source analysis, the article argues that while drones have repeatedly demonstrated their capacity to alter battlefield dynamics and shift military balances, their deployment has also produced severe and systematic civilian harm, acute accountability deficits, and strategic outcomes that remain, at best, inconclusive. The governance of these systems represents one of the most urgent security challenges facing the Horn of Africa today.

Introduction

There is a particular moment in the history of any new weapon when it stops being a novelty and becomes a norm. For armoured tanks, that moment came in the mud of the Western Front in 1916. For aerial bombardment, it came in the ruins of Guernica in 1937. For unmanned aerial vehicles, that moment has arguably arrived across the Horn of Africa not in a single dramatic event, but through an accumulating weight of strikes, deaths, and displaced populations that now form a distinctly 21st-century pattern of warfare.

Drones, of course, are not entirely new to the region. The United States Africa Command (AFRICOM) has operated over conflict zones in Somalia since 2007. But what has changed dramatically in recent years is the scale, diversity, and geographic

spread of drone warfare and critically, who is using these systems and against whom. Ethiopian federal forces deployed Turkish and Iranian drones with devastating effect during the Tigray war of 2020 to 2022. The government of the DRC is now fielding Chinese attack systems against the March 23 Movement (M23) in North and South Kivu. Both the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF) have acquired competing drone arsenals through rival external sponsors. And in Somalia, American and Turkish drones continue to strike al-Shabaab targets in a campaign that has now stretched across nearly two decades.

What unites these cases is not merely technology. It is a set of shared patterns: the involvement of external suppliers reshaping local balances of power, the systematic undercounting of civilian casualties, the absence of meaningful accountability mechanisms, and the tendency of drone campaigns to produce tactical advantage without delivering the political resolution that genuine peace requires. This article examines each of these four conflicts in turn, before drawing out the broader strategic implications for the region and for regional governance of emerging military technologies.

The Evolution of Drone Capabilities

Before turning to the case studies, it is worth briefly sketching the technological landscape that makes this analysis necessary. Military drones have changed dramatically since their first significant deployment by the United States following the September 11 attacks in 2001. Early systems like the Predator were primarily platforms for surveillance and, occasionally, targeted killing. Today's UAVs encompass a far wider spectrum: medium-altitude, long-endurance (MALE) strike aircraft capable of flying for 24 hours or more; loitering munitions that circle a target area before diving onto it; first-person-view (FPV) kamikaze drones that cost as little as a few hundred dollars to build; and long-range one-way attack vehicles capable of travelling over a thousand kilometres to strike infrastructure or military installations.

Critically, this technological diversification has been accompanied by an equally consequential diversification of supply. China, Turkey, Iran, Serbia, and Russia have all emerged as significant UAV exporters, each offering systems at price points and

with supply conditions that the established Western defence industry has generally not matched. This has dramatically lowered the barriers to entry for states and as Sudan demonstrates, for paramilitary forces that wish to acquire meaningful aerial strike capability. The result is a regional security landscape in which the monopoly on airpower that national armies once held has become increasingly contested.

This proliferation matters not just militarily but politically. When a rebel movement can acquire a drone capable of striking an international airport as M23 demonstrated in Kisangani in February 2026, the strategic calculus of any armed conflict changes fundamentally.

Case Study One: Tigray Conflict in Ethiopia

The Tigray conflict, which lasted from November 2020 to November 2022 in northern Ethiopia's Tigray region, claimed an estimated 600,000 lives—a toll that, by most comparative measures, made it one of the deadliest wars anywhere in the world in the early 21st century (European Council on Foreign Relations, 2025). It was also the first conflict in Africa in which a government deployed a diversified arsenal of Chinese, Turkish, and Iranian combat drones as a central—arguably decisive—element of its military strategy.

Ethiopia entered the war with a limited unmanned inventory. By late 2021, however, the Ethiopian National Defence Force (ENDF) had dramatically expanded its capabilities. Open-source investigators documented Turkish Bayraktar TB2 drones, Chinese Wing Loong and CH-4 systems, and Iranian Mohajer-6 combat UAVs at four separate Ethiopian air bases (European Council on Foreign Relations, 2025). The acquisition of these systems was, in retrospect, militarily decisive. When Tigray Defence Forces (TDF) advanced to within roughly 200 kilometres of Addis Ababa in November 2021, it was drone-backed operations providing real-time intelligence, directing artillery strikes, and hitting TDF logistics nodes that enabled the ENDF to halt and then reverse the rebel advance (European Council on Foreign Relations, 2025). By December 2021, government forces had pushed the TDF back fully into Tigray.

The military effectiveness of this campaign, however, was matched by its human cost. Between October 2021 and January 2022 alone, aerial attacks caused at least 143 documented deaths and over 213 injuries in Tigray and researchers have consistently noted that these figures substantially undercount actual casualties, given the near-total communications blackout imposed by Addis Ababa (Insecurity Insight, 2022). The number of documented strikes causing civilian harm ran into the dozens.

The most extensively verified of these incidents occurred on January 7, 2022, when an armed drone struck the compound of Dedebit Elementary School in northwestern Tigray, which was at the time sheltering thousands of internally displaced people. Analysis of shrapnel recovered from the site, combined with satellite imagery and video documentation, allowed investigators to confirm the use of Turkish-manufactured precision-guided munitions in the strike, which killed at least 57 civilians and wounded 42 others (Human Rights Watch, 2022; Washington Post, 2022). Approximately one month later, on February 7, 2022, a strike on another displacement camp killed at least 59 people (Insecurity Insight, 2022).

The targeting was not confined to displacement sites. Internal documentation shared by humanitarian organisations with the Washington Post recorded more than 300 civilian deaths from drone and airstrikes between September 2021 and early 2022, with hit locations including a flour mill, public buses, farms, hotels, and busy market areas in multiple towns across Tigray (Washington Post, 2022). Aid workers were not spared: on October 28, 2021, a drone strike killed a United Nations High Commissioner for Refugees (UNHCR) staff member while he was travelling by car. On October 14, 2022 after the formal cessation of hostilities had been announced a strike killed an International Rescue Committee (IRC) nutrition programme worker in Shire (Insecurity Insight, 2022). The Ethiopian government never publicly acknowledged or explained any of these strikes. The only independent international mechanism investigating violations the UN Human Rights Council's International Commission of Human Rights Experts on Ethiopia was terminated in October 2023 following lobbying by the Ethiopian government and its supporters in the Council. No accountability process has emerged since.

What the Tigray case demonstrates, above all else, is that the availability of drone technology does not, of itself, produce precision or restraint. The systems used—notably the Turkish TB2 with its laser-guided munitions—are capable of precision. Whether precision is exercised depends on targeting intelligence, command authority, and the presence or absence of meaningful legal constraints. In Tigray, all three were effectively absent.

Case Study Two: Somalia

Somalia has the distinction of being the site of the longest-running institutionalized drone campaign on the African continent. Since 2007, AFRICOM has conducted over 262 strikes in the country, aimed primarily at dismantling the operational capacity of al-Shabaab—the al-Qaeda-affiliated insurgent network that controls large swathes of rural Somalia, extracts taxation from the population under its control, and continues to conduct complex attacks in Mogadishu and southern Somalia (Foundation for Defense of Democracies, 2024).

What distinguishes the Somalia campaign from Tigray and Sudan is its institutional framework. AFRICOM publishes regular press releases acknowledging strikes and claiming non-combatant casualty assessments. Operations are conducted with the formal consent and cooperation of the Federal Government of Somalia (FGS) and are generally coordinated with the Somali National Army (SNA). In January 2026, for instance, AFRICOM confirmed coordinated strikes targeting al-Shabaab in the vicinity of Godane, northeast of Mogadishu (AFRICOM, 2026). This level of transparency—imperfect as it is—represents a qualitatively different approach to drone warfare than that practiced by the ENDF in Tigray or either party in Sudan.

Yet transparency and effectiveness are not the same thing, and the Somalia campaign raises significant questions about the limits of drone-based counter-insurgency. Rossiter (2020), drawing on interview data from Mogadishu and the wider region, argues that United States drone strikes offer the occasional but only reliable check on al-Shabaab, thereby allowing the FGS to continue functioning. This is a carefully hedged assessment, and it is worth sitting with its implications. Nearly two decades of strikes have not broken al-Shabaab. The movement has lost multiple mid- and

senior-level commanders to drone strikes but has consistently replaced them. It retains the capacity to impose devastating attacks on Mogadishu and to tax and administer large rural populations. The structural conditions that sustain it—governance failure, economic marginalisation, clan politics—are untouched by aerial operations.

A further dimension has emerged in recent years that adds complexity to this picture. Turkey has become an active participant in the drone war against al-Shabaab, conducting at least 19 strikes since 2022 according to data compiled by the Foundation for Defense of Democracies (2024). This multi-actor character of the campaign with American and Turkish drones now operating alongside Somali forces raises questions that have not been adequately addressed publicly: about coordination protocols, about the cumulative impact on civilian populations, and about accountability when things go wrong.

The Foundation for Defense of Democracies (2024) data also records that AFRICOM conducted at least 18 airstrikes inside Somalia in 2023, making it the most active year for United States military operations in Somalia since 2021. Strikes have continued into 2025 and 2026 at a sustained tempo. This is an extraordinary long-term military commitment one whose strategic dividends remain, by any objective measure, contested. Drone warfare can degrade and disrupt. It cannot govern, build, or reconcile.

Case Study Three: Eastern Democratic Republic of Congo (DRC)

The conflict in the eastern DRC is one of the oldest, most complex, and most deadly in the world. Rooted in the aftermath of the Rwandan genocide, sustained by competition over minerals, ethnic grievances, and the political calculations of regional powers, it has displaced millions and killed hundreds of thousands over the past three decades. The resurgence of M23 from 2021 with documented military support from Rwanda added a new and more capable actor to a conflict that was already extraordinarily difficult to manage. The introduction of combat drones has added yet another layer of complexity.

The DRC government's decision to acquire Chinese CH-4 MALE attack drones in 2023 was driven by a clear tactical logic. Ground-based operations in the rugged terrain of North and South Kivu are costly and slow. The ENDF's use of drones in Tigray had been widely observed by other African military establishments. Chinese CH-4 systems produced by the China Academy of Aerospace Aerodynamics and capable of extended endurance and precision strike offered the Armed Forces of the DRC (FARDC) a way to project power over contested terrain without the risks of crewed air operations (HumAngle Media, 2026). By 2024, the FARDC had supplemented this arsenal with Turkish TB2 drones, reflecting a diversification of supply sources that echoes broader African acquisition trends.

The operational record of these systems is mixed but consequential. FARDC drone operations targeted M23 positions across Masisi territory, Walikale, and multiple sites in South Kivu throughout 2024 and into 2025. The strategic significance of these strikes became clear in April 2025, when M23 offered to withdraw from Walikale on the condition that the FARDC withdraw its attack drones—an implicit acknowledgment that the aerial campaign was meaningfully degrading rebel capabilities (Xtrafrica, 2026).

The most significant single drone action in this conflict to date occurred in the early morning hours of February 24, 2026, when a FARDC drone strike near Rubaya killed Willy Ngoma, M23's long-serving military spokesperson and a figure sanctioned by both the European Union and the United Nations Security Council (Critical Threats, 2026; France 24, 2026). The strike coincided with a broader coordinated FARDC-Wazalendo offensive that temporarily retook territory around Rubaya—a town whose strategic importance is inseparable from the coltan deposits in its vicinity. Rubaya's mines produce between 15 and 30 per cent of the world's supply of coltan, a mineral that is indispensable in the manufacture of smartphones, laptops, and a range of other electronic devices (France 24, 2026). Control of these mines and the revenue they generate is not incidental to the conflict; it is one of the conflict's central drivers.

M23 has not been passive in the face of FARDC aerial operations. With Rwandan technical and military support, the movement has developed counter-drone

capabilities that have materially complicated FARDC operations. A United Nations document from February 2024 confirmed a suspected Rwandan Defence Force surface-to-air missile firing at a United Nations Organization Stabilization Mission in the DRC (MONUSCO) observation drone the first documented instance of such a system being used in the theatre (Military Africa, 2025). By December 2025, M23 had claimed to have downed a FARDC TB2 near Luvungi. In February 2026, rebel forces launched a kamikaze drone attack on Kisangani Bangoka International Airport, the FARDC's primary air support hub, deploying at least eight drones, several of which were interdicted before reaching their targets (Africanews, 2026).

The DRC case illustrates a dynamic that is likely to become increasingly common across African conflict environments: the simultaneous development of offensive drone capabilities and counter-drone measures, in a context where external technical supporters are actively involved on both sides. This dynamic does not resolve conflicts; it deepens and prolongs them.

Case Study Four: Sudan

If Tigray established the template for drone warfare in Africa, and Somalia represents its most institutionalized expression, Sudan in 2023 to 2026 represents its most extreme manifestation a drone war of extraordinary scale, conducted with near-total impunity, in which civilians and civilian infrastructure have been systematically targeted by both sides.

The civil war began in April 2023 when the power-sharing arrangement between the SAF and the RSF—the paramilitary successor to the Janjaweed militias that carried out mass atrocities in Darfur in the early 2000s—collapsed into open fighting. The human cost has been catastrophic. By early 2026, the United Nations described Sudan as the world's largest humanitarian crisis, with more than 14 million people displaced and at least 30 million in acute need of assistance (Al Jazeera, 2026a).

The drone dimensions of this conflict are staggering. According to data compiled by the Africa Center for Strategic Studies, Sudan accounted for 264 of the 484 drone strikes recorded across 13 African countries in 2024—more than half the continental

total (Al Jazeera, 2025). The pace accelerated dramatically in 2025, when approximately 472 drone strikes were recorded. By February 2026, Al Jazeera's tracking of the conflict had logged over 1,000 drone attacks since the war began (Al Jazeera, 2026a). The Armed Conflict Location and Event Data Project (ACLED) attributes at least 2,200 deaths to drone attacks since April 2023, with 80 per cent of those deaths—over 1,700 people—occurring in 2025 alone (Sudan Tribune, 2026).

The external supply chains fuelling this aerial arms race are, at this point, well documented. The SAF has received Iranian Mohajer-6 combat UAVs, reportedly delivered via cargo flights to Port Sudan from late 2023 onward. Turkey has supplied Bayraktar drones, channelled through Egypt. Russia shifted in 2024 from supporting RSF-linked entities to backing the SAF directly, partly in exchange for progress on a long-sought Red Sea naval base agreement (Al Jazeera, 2026a). The RSF, which possesses no conventional air force, has been armed through a separate network. A 2024 Amnesty International report documented Chinese and Serbian drones in RSF operations. Chinese FH-95 kamikaze systems with reported ranges of up to 2,000 kilometres have been identified in high-profile RSF strikes, reportedly supplied through the United Arab Emirates via transit points in Libya, Chad, and South Sudan (Al Jazeera, 2026a).

The civilian toll from this aerial campaign is, by any reasonable standard, catastrophic. On October 11, 2025, an RSF drone struck a displacement shelter at Dar al-Arqam within the compound of Omdurman Islamic University in El Fasher, killing at least 57 people among them 22 women and 17 children (Geopolitical Monitor, 2025). Earlier attacks on displacement camps in El Fasher killed over 120 people across multiple strikes. A United Nations report documented an RSF drone strike on a mosque during Friday prayers that killed 11 children. On October 17, 2025, a SAF drone strike in El Mazroub, North Kordofan, killed at least 18 civilians. In Kadugli, South Kordofan, UN reporting attributed at least 100 civilian deaths to strikes on a kindergarten and a hospital in December 2025 (Sudan Tribune, 2026).

Infrastructure has been targeted with equal disregard. RSF drones struck Khartoum International Airport on October 21 and 22, 2025, days before its planned reopening

the first since the conflict began. Strikes on dams and electrical transmission infrastructure in Blue Nile and Sennar states on the same night plunged cities into darkness and disrupted access to essential services (OHCHR, 2025). In May 2025, RSF strikes hit airports and fuel depots in Kassala and Port Sudan the primary hub for all humanitarian logistics in Sudan forcing a temporary suspension of United Nations humanitarian flights (ACAPS, 2025). A February 2026 strike struck four vehicles, including trucks carrying United Nations relief supplies, in the Er-Rahad and Es Samih areas of North Kordofan (Al Jazeera, 2026b).

Technologically, the conflict has entered a spiral of escalation. The SAF has developed a domestically produced one-way attack drone, the Safrouq, with a stated range of 600 kilometres and integrated anti-jamming systems—a direct response to the RSF's deployment of Belarusian Groza-S electronic warfare equipment designed to identify and neutralise incoming drones (Africa Defense Forum, 2025). Long-range RSF drones launched from Darfur have targeted SAF bases in Port Sudan, forcing the relocation of Bayraktar aircraft to underground storage. The war in the air has become, in many respects, as technically sophisticated as anything currently being observed in Ukraine or the Middle East.

Cross-Cutting Themes And Strategic Implications

The four case studies examined in this article are, in important ways, distinct. They involve different actors, different political contexts, different levels of institutional oversight, and different scales of violence. Yet they share a set of structural features that together define the character of drone warfare in the Horn of Africa as it is currently practiced.

a) **The democratization of aerial strike capability**

Perhaps the most consequential development documented across these cases is the extent to which meaningful aerial strike capability has migrated from the exclusive domain of major military powers to a far wider range of actors. The RSF, a paramilitary force with no air force, no trained pilots, and no maintenance infrastructure has acquired drones capable of striking targets over 2,000 kilometres away. M23 rebels have attacked an international airport with kamikaze UAVs. Al

Shabaab has been struck by Turkish government drones operating under a bilateral agreement with the FGS. This is a genuinely new strategic environment, and its implications for regional stability are profound.

b) **The gap between precision and protection**

Manufacturers and governments alike frequently invoke the concept of precision when justifying the deployment of armed drones. The evidence from the Horn of Africa complicates this claim significantly. Precision is a property of a system in a particular targeting environment, with particular intelligence inputs, under particular command conditions. When those conditions are absent—when intelligence is poor, when accountability is weak, when civilian harm carries no consequences—precision does not translate into protection. Across Tigray, Sudan, and the DRC, documented evidence consistently shows strikes hitting schools, displacement camps, hospitals, mosques, markets, and humanitarian convoys. These were not predominantly accidents of faulty technology; they were products of faulty governance.

c) **The accountability crisis**

None of the four conflicts examined here has produced a functioning accountability mechanism for documented violations of international humanitarian law attributable to drone strikes. In Ethiopia, the UN investigative mechanism was closed. In Sudan, the scale of violations has overwhelmed international capacity and political will. In the DRC, accountability processes for aerial strikes remain largely absent. This impunity is not incidental to the problem; it is part of the problem. When operators of drone systems face no consequences for civilian harm, the incentives for restraint are correspondingly diminished.

d) Strategic inconclusiveness

It is worth being blunt on this point. Drone warfare in the Horn of Africa has not resolved a single conflict. In Ethiopia, the Tigray war ended in a negotiated cessation of hostilities, not in a military victory, and the underlying political grievances remain unresolved. In Somalia, al-Shabaab endures after 18 years of strikes. In the DRC, M23 captured Goma and Bukavu in early 2025 despite sustained FARDC drone operations.

In Sudan, nearly three years of intensive aerial bombardment have produced mass death but no decisive military or political outcome. Drones can change who is winning a battle. They cannot determine who wins a war, and they certainly cannot build a peace.

e) **The regional governance deficit**

The Horn of Africa lacks any regional framework specifically governing the acquisition, transfer, or use of armed drones in conflict. The African Union has not developed standards or norms for drone use in armed conflict. There is no regional equivalent to the discussions on autonomous weapons systems taking place in international forums. External suppliers—Chinese, Turkish, Iranian, Serbian, Russian, and Emirati—operate in this governance vacuum without conditionality or accountability. Addressing this gap is, in the view of this Institute, one of the most urgent medium-term security governance priorities in the region.

Conclusion

The drone is not, in itself, a protagonist in the conflicts of the Horn of Africa. It is a tool capable of extraordinary precision and extraordinary harm, depending entirely on the decisions of those who deploy it, the intelligence that guides it, and the accountability frameworks within which it operates. What the four case studies examined in this article demonstrate is that, in the Horn of Africa as it currently stands, those decisions are often poorly constrained, that intelligence is frequently inadequate, and that accountability frameworks are largely absent.

This is not a counsel of despair. It is a challenge for regional governments, for the African Union, for international partners, and for analytical institutions to bring the same urgency to the governance of drone warfare. The proliferation of unmanned aerial systems is not slowing. The conflicts in which they are being used are not resolving. The civilians who are paying the highest price in Tigray, in Mogadishu's hinterland, in the coltan-rich hills of North Kivu, in the ruins of El Fasher deserve better than a regional and international community that watches, documents, and does little else. Mastery of drone technology will increasingly determine battlefield outcomes across the Horn of Africa. Mastery of the governance frameworks needed

to constrain that technology may, in the end, determine whether peace in this region is achievable at all.

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