

Policy Brief 33 MAR 2025

The Myth of the Gamechanger: Drones and Military Power in Africa

Gerrit Kurtz, Wolfram Lacher, and Denis M. Tull

Medium-altitude long-endurance combat drones are increasingly appearing in armed conflicts in Africa. In contexts where governments have historically possessed little or no air power, some expect drones to change the balance of military power between state and non-state forces. But is this actually the case? This Policy Brief examines the role played by drones in recent conflicts in Mali, Chad and Sudan, finding three aspects to be particularly relevant. Firstly, access: does one conflict party enjoy privileged access to drones and interception technology? Secondly, is the fighting regular or irregular? Are both sides holding territory and fighting on definable fronts, or is it a guerrilla war? Thirdly, is the terrain open or covered? Are the distances involved within the range of available drones? In Africa's theatres of conflict these factors rarely combine in ways that allow one side to derive a major strategic advantage from the use of combat drones.¹

Since 2019 there has been a rapid proliferation of medium-altitude long-endurance (MALE) combat drones in armed conflicts in Africa (see infographic 1). Proliferation has been driven principally by the United Arab Emirates (UAE), Turkey and Iran. The advent of comparatively cheap but technologically advanced combat drones has given entities that previously lacked significant air power the capacity to carry out precision airstrikes. The acquisition of Turkish-made Bayraktar TB2 drones by multiple African governments epitomises this development.²

Innovations in drone warfare, as seen in Ukraine and Yemen, have sparked debate over the extent to which combat drones are transforming the way wars are fought.³ Interest has concentrated primarily on large-scale confrontations involving advanced military capabilities, including sophisticated air defence systems. Much of the recent discussion has revolved around single-use first-person-view drones and commercial drones repurposed to

¹ The authors would like to thank Aldo Kleemann, Sven Arnold, Yvan Guichaoua and Christine Hackenesch for their valuable feedback, and Andrea Grillandi for the data analysis.

² Noé Hochet-Bodin, "L'Afrique, nouveau terrain de jeu des exportateurs de drones", *Le Monde*, 27 December 2023; Léo Péria-Peigné, "TB2 Bayraktar: Big Strategy for a Little Drone", *Briefings de l'Ifri*, 17 April 2023; Federico Donelli, "UAVs and Beyond: Security and Defence Sector at the Core of Turkey's Strategy in Africa", *Megatrends Afrika*, Policy Brief 02, March 2022.

³ Antonio Calcara et al., "Why Drones Have Not Revolutionized War: The Enduring Hider-Finder Competition in Air Warfare", *International Security* 46, no. 4 (2022): 130–71; Sarah Kreps and Paul Lushenko, "Drones in Modern War: Evolutionary, Revolutionary, or Both?", *Defense & Security Analysis* 39, no. 2 (2023), 271–74.

carry explosives, both of which are techniques that can be used by non-state actors to level the playing field in confrontations with advanced militaries.⁴

Far less attention has been paid to the specific consequences of the proliferation of MALE combat drones for African conflicts.⁵ In most African theatres, air power has historically been largely the preserve of external forces. Few African governments possessed meaningful air forces capable of giving them an advantage over insurgents.⁶ The proliferation of combat drones could potentially alter the balance of military power in conflicts. Given that civil war is the predominant conflict type in Africa, this question applies primarily to the relative strength of state forces and insurgents. This matter is not merely of academic interest. The supposedly game-changing impact of combat drones is widely discussed by military officers and rebel leaders, and their rapid acquisition by African governments suggests this belief is widespread.⁷

Sceptics rightly point out that technical innovations such as combat drones are not revolutionary in and of themselves. Their impact depends on strategic and tactical capacities, command-and-control structures, and the logistics required to deploy them effectively and at scale.⁸ Nevertheless, we would argue that the impact of combat drones on conflicts in Africa will be defined by three aspects, all other factors remaining equal:

- Symmetry: Do both sides have access to MALE drones and air defence systems;
- Type of warfare: Is the conflict primarily regular or irregular? In other words, do the parties control territory demarcated by fronts, or are they engaged in guerrilla warfare characterised by hit-and-run tactics;
- Topography: Is the terrain characterised by vast open spaces, or does it provide cover in the form of mountains, vegetation or settlements.

On the basis of recent and ongoing African conflicts, we would suggest that MALE drones are only likely to offer a clear strategic advantage under a specific set of circumstances: if the adversary lacks access to drone or drone interception technology (which generally requires state sponsorship); if the adversary fights in the open; and if the terrain makes it difficult for the adversary to hide. It is rare for all three conditions to be present. The cases described below exemplify three different combinations: asymmetric access to drones and countermeasures, irregular warfare, and a mix of open and covered terrain in Mali; asymmetric access, regular warfare and open terrain in Chad; and dynamic and competitive access to drones and countermeasures, regular warfare, and a mix of open and covered terrain in Sudan.

⁴ Marcel Plichta and Ash Rossiter, “A One-Way Attack Drone Revolution? Affordable Mass Precision in Modern Conflict”, *Journal of Strategic Studies* 47, no. 6–7 (2024): 1–31; Kelsey D. Atherton, “Mass-Market Military Drones Have Changed the Way Wars Are Fought”, *MIT Technology Review*, 30 January 2023; Hannah Beech and Paul Mozur, “Drones Changed This Civil War, and Linked Rebels to the World”, *The New York Times*, 4 May 2024; Luca Nevola and Valentin d’Hauthuille, “Six Houthi Drone Warfare Strategies: How Innovation is Shifting the Regional Balance of Power”, *ACLEDA*, 6 August 2024.

⁵ For an exception, see Brendon J. Cannon, “Out of Africa: The Impact of Drones in Sub-Saharan Conflicts”, *Defense & Security Analysis* 39, no. 2 (2023): 267–70.

⁶ “African Countries Are Investing in Air Power, Embracing Cooperation”, *Africa Defense Forum*, 26 October 2023.

⁷ See, for example, the assertion by a Malian officer that combat drones “have allowed our army to make a leap. In fact, it’s due to them that we are still holding on,” and RSF leader Dagalo’s attribution of a battlefield defeat to the adversary’s use of Iranian drones. Benjamin Roger, Thomas Eydoux, “Drones turcs, avions russes... Au Sahel, la guerre des airs est déclarée”, *Le Monde*, 20 November 2024; “Sudan’s RSF Leader Admits Defeat in Al Jazirah State, Vows to Fight On”, *Sudan Tribune*, 11 January 2023.

⁸ Calcara et al., “Why Drones Have Not Revolutionized War”.

The Importance of Access, Type of Warfare and Topography

The idea that the introduction of MALE combat drones could significantly alter the balance of power in African conflicts depends heavily on an assumption that they will be available to governments but not to rebel groups.⁹ The same can be said of the technology needed to counter them, including sophisticated air defence systems and jamming equipment. By contrast, smaller drones are within the reach of both state and non-state actors, and can be used for reconnaissance, artillery targeting, or to carry explosives.¹⁰ They are also easier to shoot down, at low altitude even with small arms. Whether smaller drones will level the playing field in favour of weaker actors is disputed and beyond the scope of this paper. The advantages of advanced military drones are their endurance, range and operability. The Turkish Bayraktar TB2 drone, for example, can fly for more than twenty hours at a communications range of up to 150 kilometres; it possesses night-vision capabilities and carries up to four laser-guided missiles.¹¹ The Iranian Mohajer-6 can fly for about twelve hours and has a range of up to 200 kilometres; it can carry reconnaissance and surveillance equipment or two guided missiles.¹² The usual operating altitude of these drones is beyond the range of man-portable mobile air defence systems (MANPADs), requiring sophisticated anti-aircraft defence systems to down them. Their cost and training requirements put them beyond the reach of most non-state actors, although they remain cheaper and easier to operate than crewed military aircraft.

Crucially, however, government forces are not always the only party employing combat drones. In certain civil wars neither side represents a legitimate government and both parties enjoy significant foreign support, for example in Libya (2019–20) and Sudan (since 2023). In these cases, both sides have access to combat drones and counter-measures. With a growing number of non-Western states now intervening in African conflicts, that scenario could become more common in the coming years.¹³ The question of whether or not one party enjoys privileged access to combat drone technology is a critical factor for the balance of military power. If both sides have equal access to combat drones and countermeasures, their relative influence is likely to diminish.

⁹ Kerry Chávez and Ori Swed, “Off the Shelf: The Violent Nonstate Actor Drone Threat”, *Air & Space Power Journal*, Fall 2020: 29–43.

¹⁰ These are usually vertical take-off and landing aircraft (VTOL) with rotors. They do not require runways but have a smaller range and lower altitude than MALE drones.

¹¹ “Bayraktar TB2 Turkish Unmanned Aerial Vehicle (UAV)”, OE Data Integration Network (ODIN).

¹² “Mohajer-6 Iranian Unmanned Aerial Vehicle (UAV)”, OE Data Integration Network (ODIN).

¹³ Wolfram Lacher, “African Conflicts amid Multipolarity: Implications of a Changing Actor Landscape”, *Megatrends Afrika*, Policy Brief 03, April 2022.

African Countries Operating Medium Altitude Long Endurance (MALE) Drones



Infographic 1: African Countries Operating Medium Altitude Long Endurance (MALE) Drones.

Combat drones are effective when their operators are able to identify valuable targets for drone strikes or artillery fire. Unlike more advanced militaries, the forces involved in African civil wars must usually identify their targets without recourse to special forces or signals and satellite intelligence. Target identification depends on the extent to which adversaries choose – or are compelled – to operate openly, in other words whether they engage primarily in regular or irregular warfare. The degree to which the topography allows forces to hide is also relevant.

In irregular warfare one side operates largely clandestinely within territory controlled by the other.¹⁴ While the parties in a regular civil war frequently conceal their assets in order to protect them from aerial or artillery bombardment, their movements and troop concentra-

¹⁴ We follow Stathis Kalyvas' distinction between regular and irregular warfare: "Irregular warfare, thus, takes place when the weaker actor refuses to face the stronger one directly and, instead, fights by deception. In this sense, irregular warfare is an unambiguously proclaimed manifestation of military asymmetry. (...) A stylized description of irregular war is as follows: the state (or incumbents) fields regular troops and is able to control urban and accessible terrain, while seeking to engage its opponents militarily in peripheral and rugged terrain; challengers (rebels or insurgents) 'hover just below the military horizon,' hiding and relying on harassment and surprise, stealth and raid." Kalyvas, *The Logic of Violence in Civil War* (Cambridge: Cambridge University Press, 2006), 67.

tions will be far more visible than those of a guerrilla movement. In irregular civil wars, where insurgents frequently try to blend into the civilian population, drone strikes often end up causing civilian casualties that further inflame the insurgency. The use of combat drones is therefore likely to be more effective in regular civil wars.¹⁵ However, forces operating in the open may respond to their adversary's use of drones by turning towards irregular warfare.

Finally, the impact of MALE combat drones will depend on topography and visibility. Rugged terrain, forest cover and settlements offer ample opportunity for concealment. Even where the terrain is open, as in the vast spaces across northern Africa, cloud cover or sandstorms can temporarily hamper the use of reconnaissance and attack drones.¹⁶ Nevertheless, air superiority still creates a distinct advantage in urban combat, where reconnaissance is particularly intense, since it focuses on areas immediately adjacent to frontlines.

The Impact of Combat Drones in Three African Conflict Settings

Mali

Since 2012 Mali's national government has been involved in armed conflict with two distinct but partly overlapping sets of opponents. The first is the separatist groups in the north that have been fighting for an independent "Azawad" state in northern Mali, currently in the guise of the Front pour la liberation de l'Azawad (FLA). The second set of groups comprises various jihadist insurgents, including Jama'at Nusrat al-Islam wa-l-Muslimin (JNIM). While JNIM's strongholds are in central and northern Mali it increasingly operates throughout the country.

With respect to drones, there is stark asymmetry between Mali's armed forces (FAMA) and their insurgent adversaries. While the FAMA enjoys significant air superiority with warplanes, attack helicopters and armed drones, jihadist and separatist groups employ small commercial drones for local reconnaissance (and have recently weaponised drones to attack the FAMA).¹⁷

The FAMA received its first TB2s drones in late 2022, and today possess at least eight,¹⁸ with some sources claiming as many as seventeen.¹⁹ It recently also acquired at least two Bayraktar Akinci drones, which are far more powerful than the TB2 in terms of range, altitude and weaponry.²⁰

As would be expected, the increasing availability of drones was accompanied by a sharp uptick in their use, even if the overall number of drone strikes remains modest. The number of drone strikes doubled within a year, from 21 (October 2022 – September 2023) to 48 (October 2023 – September 2024).²¹ Between October 2022 and December 2024, roughly

¹⁵ Cf. James S. Corum and Wray R. Johnson: *Airpower in Small Wars: Fighting Insurgents and Terrorists* (Kansas: University of Kansas Press, 2003), 427.

¹⁶ Cannon, "Out of Africa".

¹⁷ Basillioh Rukanga, "Ukraine Denies Supplying Drones to Mali Rebels", *BBC*, 15 October 2024.

¹⁸ Benjamin Roger, Thomas Eydoux, "Drones turcs, avions russes... Au Sahel, la guerre des airs est déclarée", *Le Monde*, 20 November 2024.

¹⁹ Dan Sanaren, Ian Grgic and Virginia MacArthur, "Drone Warfare in Mali: Evolutions and What to Expect", unpublished manuscript, 2024.

²⁰ Lionel Ekene, "Mali Acquired Akinci Drone, after Bayraktar TB2", *Military Africa*, 2 December 2024.

²¹ Sanaren et al., *Drone Warfare in Mali*.

every third air strike came from a drone (69 out of 278), and the proportion is growing.²² Casualties from drone strikes nearly doubled to 318 over the same period, with 60 percent reportedly civilians.²³ This raises questions about the FAMA's rules of engagement for drones.

The intensity of drone warfare varies geographically. Roughly three out of four drone strikes have been carried out in northern Mali (regions of Kidal, Timbuktu, Gao, Menaka), most of them (32 strikes) in Kidal.²⁴ Interestingly Menaka, which is the stronghold of the Islamic State (Sahel Province), was targeted comparatively rarely (four drone strikes).

It is plausible that the focus on Kidal is associated with a political choice to prioritise the fight against the separatists, who are strongest there. Malian nationalists consider northern separatism as an existential challenge. The concentration of drone strikes on Kidal may reflect an expectation in Bamako that military successes against the separatists will bolster the government's domestic popularity.

Northern Mali's topography and demography certainly make the region more conducive to drone warfare than the country's central region. The latter is more densely populated, with vegetation offering more cover than the open terrain of the north. Jihadist groups have adapted well to conditions in the north. Their embrace of irregular warfare is a response to setbacks a decade ago, when they sought to exert territorial control and build "proto-states".²⁵ Those attempts prompted an internationally backed French military intervention, followed by a relentless counterinsurgency campaign including drone strikes, aerial bombardment and special forces operations. In response, the jihadists have established a decentralised and largely rural form of shadow governance.²⁶ The jihadist insurgency is politically powerful and rooted in local communities, and has expanded steadily since 2017. While the FAMA directs much of its counterinsurgency efforts towards the jihadists, drones are used sparingly in central Mali's Mopti region, suggesting that their relative utility is greater in the north.

Indeed, northern Mali would seem to be a more obvious choice for the use of drones. The terrain is largely open and very sparsely populated, potentially making it easier to identify targets than in central Mali. Drones can also address some of the structural difficulties faced by conventional land-based counterinsurgency. The government forces are comparatively small and thinly spread. With few bases in the north, they struggle with enormous distances and difficult logistics in hostile terrain, as did MINUSMA and the French counterterrorism Operation Barkhane. Deploying and effectively leveraging massed forces in the north seems implausible under current conditions. This makes drones a default option for at least containing extremely mobile insurgents operating in small, dispersed tactical groups.

Yet the very conditions that make drones potentially useful for counterinsurgency also impose tight limits on their impact. The vast distances involved also restrict the ability of FAMA drones operating out of Gao to collect and respond to reliable intelligence. Combining drone operations with ground forces and other capabilities is a challenge (their use during the successful FAMA assault on Kidal in 2024 notwithstanding). Mali's insurgents tend to be highly mobile, precisely because irregular tactics help them to avoid airstrikes. The conventional static scenario that occurred in Kidal is rare in Mali and difficult to replicate.²⁷ The

²² Author's calculation based on data by the *Armed Conflict Location & Event Data Project* (ACLED); www.acleddata.com.

²³ Sanaren et al., *Drone Warfare in Mali*.

²⁴ ACLED data.

²⁵ Alex Thurston, "Timbuktu: A Laboratory for Jihadists Experimenting with Politics", *War on the Rocks*, 23 January 2019.

²⁶ Jean-Hervé Jezequel and Vincent Foucher, "Forced Out of Towns in the Sahel, Africa's Jihadists Go Rural", *International Crisis Group*, 11 January 2017.

²⁷ Sanaren et al., *Drone Warfare in Mali*, 7.

sheer size of the northern region and the mobility of the small enemy units mean that drones have little impact. Finally, the small number of drones available to the FAMA is a relevant factor. Drones are scarce and costly in relation to the size of the country and the financial constraints on its government. All of this may explain why, after deploying TB2 drones for two years, the Malian authorities have reported just one successful strike on a high value target, namely the Tuareg leader, Fahad Ag Almahmoud.²⁸ And there is no guarantee that a higher success rate would change the situation significantly. And even though Operation Barkhane was very successful in eliminating top jihadist commanders, this did not slow the growth of such groups. As French officers admitted, the jihadist groups have no difficulty replacing their losses, not least because civilian casualties caused by drone strikes spur recruitment.²⁹ Whether Mali's northern separatists will prove similarly resilient is an open question.

So far there is little evidence that drone warfare has had any substantial impact on the balance of military power in Mali. In the north it has helped to dent the territorial ambitions of separatist movements, and probably has a significant psychological effect on their forces. But whether drones can defeat them is another question, even if they currently appear to be on the defensive. They may simply adapt their tactics and strategies, as the jihadist groups have done with remarkable success since 2013. In light of Mali's geography and topography, and the irregular nature of the conflicts, drones are an additional weapon for the Malian army, but no more than that. The most interesting effect of drones in Mali may be outside of the battlefield – and beyond the scope of this paper. Drones reinforce the popularity and legitimacy of Mali's military government by embodying the army's modernisation and the prospect of the military leading Mali out of its existential crisis.

Chad

For two decades now, Chadian insurgent groups have been unable to establish a foothold within Chadian territory. Instead, the threat they pose to the regime – led by Idris Deby from 1990 to 2021 and his son Mahamat since 2021 – has consisted in lightning offensives seeking to reach N'Djamena, originating from bases in neighbouring countries. Air power has proven critical in stopping or deterring such incursions, for example in 2019 when French warplanes inflicted heavy casualties on a column of the Union des Forces de Résistance (UFR) that had entered Chad from Libya.³⁰ In the absence of intervention by the French air force, rebel offensives launched from Darfur twice reached N'Djamena (in 2006 and 2008). A 2021 incursion from Libya came within three hundred kilometres of the capital and was stopped only by ground fighting during which Idris Deby was killed.³¹

Chad acquired its first Turkish combat drones in mid-2023, and decided in late 2024 to end France's military presence.³² Clearly acquiring its own capability for precision airstrikes was a necessary condition for the government to dispense with French forces. The question is whether the government can now deter rebel attacks as effectively as the French air force

²⁸ "Mali Says Army Drone Strike Killed Senior Rebel Commander, Others", *VOA*, 1 December 2024.

²⁹ Jean Gaël Le Flem and Bertrand Oliva, *Un sentiment d'inachevé: Réflexions sur l'efficacité des opérations* (Paris: Ecole de Guerre, 2018).

³⁰ Adam Nossiter, "Can France Ever Leave Africa? Airstrikes in Chad Raise an Old Question", *New York Times*, 14 February 2019.

³¹ Jérôme Tubiana, "Déby's Spring Fall: How an Unlikely Rebellion Toppled Chad's Dictator", *Small Arms Survey*, 31 August 2021.

³² Mathieu Olivier, "Au Tchad, de quelle force aérienne dispose Mahamat Idriss Déby Itno après le départ des Français?" *Jeune Afrique*, 12 December 2024.

did. In terms of the criteria laid out above, the parameters of state-rebel interactions in Chad appear to offer ideal conditions for the effective use of combat drones.

First of all, this applies to the asymmetry of access to drone technology between the government and the insurgents. Historically the government's acquisition of combat aircraft has been constrained by its limited financial resources and the need for pilots, technicians and maintenance. Its ageing Sukhoi jets have fallen into disrepair.³³ The comparatively low cost of Turkish drones has now allowed Chad to acquire at least two Anka-S and one Aksungur. These are MALE drones with a significantly larger range and payload than the Bayraktar TB2s, and are therefore better suited to the vast distances involved.³⁴ Mahamat Deby's increasingly close relationship with the UAE will likely further improve his access to advanced military technology. Deby has facilitated Emirati military assistance for the Rapid Support Forces in Sudan, including the UAE's operation of Chinese-made Wing Loong 2 drones from Chad's Amdjarass Airport, close to the border with Sudan.³⁵ The UAE has rewarded his cooperation with lavish concessional loans.³⁶

By contrast, the Chadian rebels have lacked foreign state sponsors since Idris Deby's 2010 rapprochement with Sudan, and therefore also lack access to military-grade drones and interception technologies.³⁷ After they were expelled from Sudan, they found refuge and employment as auxiliaries in Libya, which also allowed them to rearm. However, as far as is known, none of the Libyan factions have sponsored rebel incursions into Chad. Since the April 2021 offensive by the Front pour l'alternance et la concorde au Tchad (FACT), in which Idris Deby died, Khalifa Haftar's forces have sought to mend ties with his son Mahamat by clamping down on the Chadian rebel presence in southern Libya. That said, former, current and prospective Chadian insurgents are keeping a close eye on the course of the war in Sudan, calculating that the Sudanese Armed Forces (SAF) could at some point respond to Deby's support for the RSF by backing Chadian rebel forces.³⁸ Whether this would open up access to sophisticated weaponry is, of course, a different matter.

The frontal rebel offensives that have characterised the Chadian conflict are obviously vulnerable to airstrikes. As long as Chadian insurgents are unable to organise within Chad, their only practicable modus operandi is long-range surprise attacks from sanctuaries in neighbouring countries. The calculation appears to be that any failure of government forces to repel them would pierce their aura of invincibility and trigger defections, ultimately causing the regime to collapse.

Such offensives were a daunting prospect as long as the rebel columns faced French air power. Or, as one former UFR leader said of the group's ill-fated 2019 offensive: "*I don't understand why [UFR President Timan Erdimi] did it. It was suicide.*"³⁹ The insurgents may have been counting on France's reluctance to intervene openly to save the Deby regime. Indeed, there were no French airstrikes during the 2006, 2008 and 2021 rebel offensives, even if Presidents Sarkozy and Macron both threatened to intervene.⁴⁰ In all three cases, however, French assistance – in the form of reconnaissance, logistics, equipment and the

³³ Ibid.

³⁴ "Turkish Defence Flagships Cash In on N'Djamena's Need for Drones and Aircraft", *Africa Intelligence*, 14 June 2023; Jeremy Binnie, "Chadian Air Force Unveils Aksungur UAV", *Janes*, 23 April 2024.

³⁵ Declan Walsh, Christoph Koettl and Eric Schmitt, "Talking Peace in Sudan, the U.A.E. Secretly Fuels the Fight", *The New York Times*, 29 September 2023; Declan Walsh and Christoph Koettl, "How a U.S. Ally Uses Aid as a Cover in War", *The New York Times*, 25 September 2024.

³⁶ "Le Tchad reçoit une enveloppe de 500 millions de dollars des Émirats", *Jeune Afrique*, 18 October 2024.

³⁷ Jérôme Tubiana, *Renouncing the Rebels: Local and Regional Dimensions of Chad-Sudan Rapprochement* (Geneva: Small Arms Survey, 2011).

³⁸ Author interviews with former rebel leaders, N'Djamena, October 2023.

³⁹ Author interview with former rebel leader, N'Djamena, October 2022.

⁴⁰ "Sarkozy Warns Chadian Rebels", *France 24*, 5 February 2008; "In Tribute to Friend Deby, Macron Says France Will Not Tolerate Threats to Chad", *Reuters*, 23 April 2021.

defence of critical infrastructure such as N’Djamena airport – was crucial to the defeat of the rebel offensives.⁴¹ One veteran of the 2006 and 2008 offensives concluded: “It was France that caused us to fail.”⁴²

Since the departure of the French forces, the Chadian government now relies on its newly acquired Turkish drones for deterrence – and the government has proudly touted its drones and other new defence equipment. Shortly after acquiring its first UAVs it carried out drone strikes on rebel bases just across the border in Libya, to demonstrate its new capabilities.⁴³ The main Libyan-based Chadian rebel faction FACT scattered shortly afterwards. Although their dispersion was partly attributable to attacks and arrests by Haftar’s forces, the threat of drone strikes likely also contributed.⁴⁴ Some observers remain sceptical that UAVs can be as effective as French warplanes in stopping future rebel offensives, not least because they can only fire a small number of missiles before they have to return to base.⁴⁵

The vast arid, open expanses of much of Chad’s territory exacerbate the vulnerability of rebel columns driving towards the capital from bases in neighbouring countries. Moreover, such assaults can only be undertaken during the dry season, since the rains make long-distance ground operations impracticable. Offensives launched from Libya, which require rebels to cross more than a thousand kilometres of open desert, are particularly vulnerable. When FACT launched its April 2021 offensive, one leader of a different rebel group expressed disbelief at what FACT leader Mahamat Mahdi Ali was risking: “*His strategy makes no sense. He has to withdraw!*”⁴⁶ After the offensive was defeated, one member of another Libyan-based group said that the Central African Republic would be a far better sanctuary: “*It’s much closer to N’Djamena and has forest, mountains, water, and it’s easy to buy weapons.*”⁴⁷

Sudan

The war in Sudan differs from the conflicts in Mali and Chad, having originated within the country’s security sector. Since 15 April 2023, the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF) have been battling for territory, power and political legitimacy. The RSF was originally a paramilitary force rather than a rebel group. In fact, the SAF had previously relied on the RSF and other militias for counterinsurgency, border control and other infantry-heavy tasks.⁴⁸

Drone warfare has played an increasingly important role in the conflict. Although the initial stocks were rather small, both the main conflict parties have been able to acquire drones and related equipment through their foreign sponsors, in particular Russia, Iran, Egypt, and the UAE. In fact, almost half of all recorded drone strikes in Africa since 2019 have been in the war in Sudan (see infographic 2).⁴⁹ Nonetheless, the impact of drones needs to be seen in relation to the overall tactics, strategies and capabilities of the SAF and

⁴¹ Marielle Debos and Nathaniel Powell, “L’autre pays des « guerres sans fin »”, *Les Temps Modernes*, 2017, no. 2, 221–66; Tubiana, “Déby’s Spring Fall”.

⁴² Author interview with former rebel leader, N’Djamena, October 2022.

⁴³ “Tchad-Libye : Le FACT annonce des bombardements contre sa base et rompt son cessez-le-feu”, *Alwihda*, 18 August 2023; author interview with Western diplomat, N’Djamena, October 2023.

⁴⁴ Author interviews with former rebel leaders and Libyan actors in contact with FACT leaders, N’Djamena and Tripoli, October and December 2023.

⁴⁵ Olivier, “Au Tchad, de quelle force aérienne dispose Mahamat Idriss Déby Itno”.

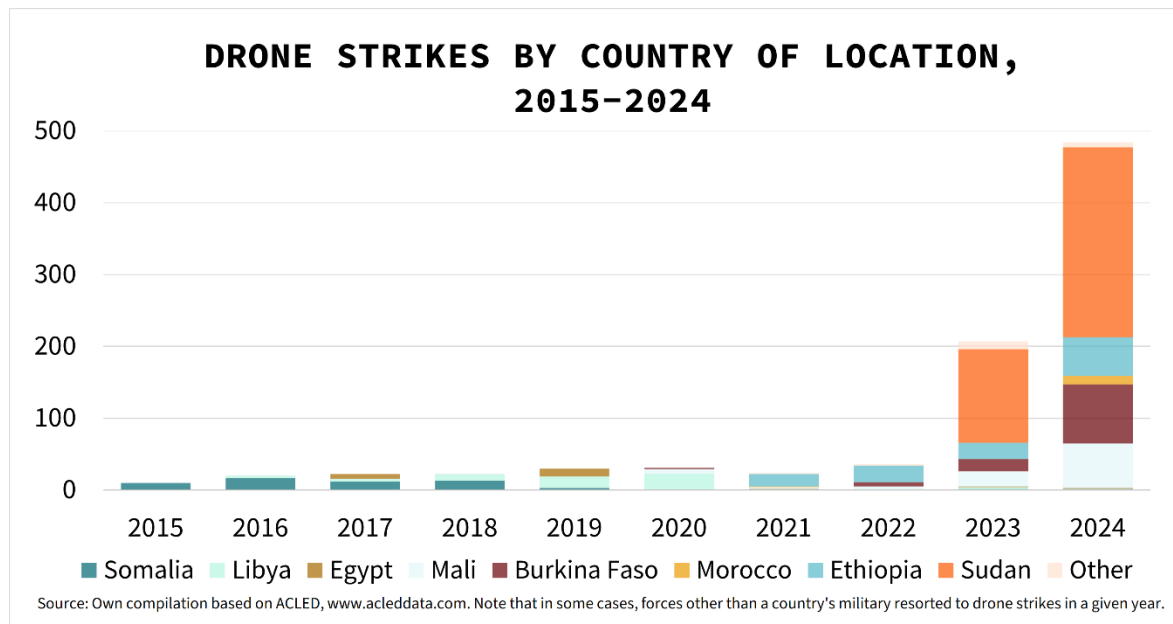
⁴⁶ Author telephone interview, April 2021.

⁴⁷ Author telephone interview, June 2021.

⁴⁸ Hassan Elhag Ali Ahmed, “Embedded Uniforms: The War in Darfur, Militias, Paramilitaries, and the Rise of the Rapid Support Forces”, *Routledge Handbook of the Horn of Africa* (London: Routledge, 2022).

⁴⁹ According to data from the Armed Conflict Location and Event Data (ACLED) project for 15 April 2023 to 31 January 2025. The source does not distinguish between MALE and smaller drones.

the RSF. To date the SAF has used MALE drones much more frequently than the RSF. According to a database of publicly available reports, the SAF has been responsible for 373 drone strikes, while the RSF accounted for just 31.⁵⁰



Infographic 2: Drone Strikes by Country of Location, 2015-2024.

The conflict has been characterised by regular warfare between the parties. The RSF's main advantage has been its ability to mobilise and deploy mechanised infantry quickly and in large numbers, strengthened after a few months by artillery, multiple-rocket launchers and anti-aircraft weapons.⁵¹ The heaviest fighting has been in urban environments, with certain cities like El-Fasher, the capital of North Darfur, effectively under siege for many months. The RSF quickly learned to disperse its troops, sheltering from SAF airstrikes in residential areas.

Sudan is a vast country, with enormous distances between the main centres of fighting in the west and centre. The distance between El-Fasher and Khartoum is around 800 kilometres as the crow flies. So, using MALE drones, whose maximum range is typically about 200 kilometres means using airfields fairly close to the front lines. This became challenging for the SAF in Darfur after it lost four of the five state capitals in late 2023, as well as territory in Greater Kordofan.

The SAF possessed large stocks of conventional weapons, as well as one of Africa's most significant domestic arms industries.⁵² Its conventional weaponry includes tanks, heavy artillery, fighter jets, helicopters, and a limited number of Chinese and Iranian drones that had been delivered to the SAF well before the start of the war (in 2017 and 2008, respectively).⁵³ In the meantime, the SAF has been able to acquire Iranian Mohajer-6 and Turkish Bayraktar TB2 drones, both of which it has deployed in active combat. By October 2023, Egypt had reportedly supplied TB2 drones to the SAF.⁵⁴ But it apparently took it more than

⁵⁰ ACLED (fn. 22)

⁵¹ UN Panel of Experts on Sudan, *Final Report of the Panel of Experts on the Sudan* (New York: UN Security Council, S/2024/65, 15 January 2024), 14.

⁵² Hager Ali, *The War in Sudan: How Weapons and Networks Shattered a Power Struggle* (Hamburg: German Institute for Global and Area Studies, February 2024).

⁵³ SIPRI Arms Transfer Database, accessed 16 January 2025.

⁵⁴ Benoit Faucon, Nicholas Bariyo and Summer Said, "Ignoring U.S. Calls for Peace, Egypt Delivered Drones to Sudan's Military", *Wall Street Journal*, 14 October 2023.

a year for them to be deployed in combat, if military sources are to be believed.⁵⁵ It is unknown how many MALE drones the SAF has bought in total.

The RSF had less heavy weaponry when the war began. Prior to the conflict it had been principally a highly mobile infantry force. While it did seize control of several airfields, it has been unable to deploy warplanes, cargo aircraft or even helicopters.⁵⁶ The RSF has two types of smaller drone, although both types employ equipment generally only available to actors with foreign sponsors: quadcopters fitted with 120 mm airdrop shells and Chinese-made Sunflower 200 suicide drones, also called loitering munitions.⁵⁷ The RSF has been able to hit targets far from the frontlines in northern and eastern Sudan. It has also benefited from intelligence gathered by the UAE using Chinese-made Wing-Loong 2 MALE drones operated from a base across the border in Chad.⁵⁸ Recently Wing-Loong 2 drones were used to attack targets in El-Fasher,⁵⁹ including a devastating strike on the last remaining hospital in the beleaguered city.⁶⁰ SAF sources claim that the RSF now also operates this type of drone.⁶¹ In the meantime, the RSF has also acquired at least three Chinese FH-95 MALE drones, which were spotted at Nyala Airport in December 2024 (although not yet in action).⁶²

The SAF's superior access to MALE and other drones has been a critical factor behind its territorial gains since early 2024, notably reconquering large parts of Omdurman from March 2024⁶³ and retaking Wad Madani, the capital of Al-Jazirah state, in January 2025. After the fall of Wad Madani RSF leader Mohamed Hamdan Dagalo admitted that Iranian drones had been instrumental in defeating his forces:

“What helped them win? The air dominance? Fighter jets? Ilyushin? Antonov? MIG? They have been attacking us with all of them for 21 months, but now the Iranian drones have appeared, and there are also other drones.”

He added:

“Initially, it was difficult for us to deal with the warplanes, but in the end we got used to them and adjusted to them. ... We will also get used to the drones. For every illness there is a remedy.”⁶⁴

The SAF reportedly uses its drones to monitor RSF movements and target them more precisely than the warplanes used at the beginning of the war.⁶⁵ Most of their drone strikes have been relatively close to Khartoum, underlining the drones' limited reach when deployed from Wadi Seidna Air Base. The SAF has relied on air strikes and ground operations – rather than drones – to target the RSF's supply lines in the west and south of the country.⁶⁶ Drones can provide useful intelligence and target RSF troop concentrations in

⁵⁵ “Sudanese Army Deploys Turkish Bayraktar drones in Khartoum”, *Sudan Tribune*, 30 November 2024.

⁵⁶ Adesogan Ayodeji and Kazim Abdul, “Several Military Aircraft Destroyed in Sudan's Merowe Airbase”, *Military Africa*, 19 April 2023 (updated 2 December 2023).

⁵⁷ Andrew McGregor, “Drones Over the Nile: Unmanned Aerial Warfare and Sudan's Rapid Support Forces”, *Aberfoyle International Security*, 24 June 2024.

⁵⁸ Walsh and Koettl, “How a U.S. Ally Uses Aid”.

⁵⁹ “RSF Drone Strike Kills 8 Police Officers in North Darfur”, *Sudan Tribune*, 26 December 2024.

⁶⁰ “Gulf States Condemn Deadly Drone Strike on North Darfur Hospital”, *Sudan Tribune*, 26 January 2025.

⁶¹ Ibid.

⁶² Caitlin N. Howarth et al., *Special Report: Advanced UAVs Identified at RSF-Controlled Nyala Airport* (New Haven: Yale School of Public Health, 2025).

⁶³ Ashraf Abdelaziz, “Sudan War: ‘Iranian Drones Played Decisive Role in Omdurman Battle’”, *Dabanga*, 17 March 2024.

⁶⁴ Rapid Support Forces Telegram Channel, 11 January 2025.

⁶⁵ “Are Iranian Drones Turning the Tide of Sudan's Civil War?” *NBC News*, 10 April 2024.

⁶⁶ In the conflict to date there have been more than three times more airstrikes than drones strikes.

the dense urban environment of Sudan's major cities where some of the conflict's heaviest fighting has taken place. But reconquering the cities still requires extensive ground offensives.

The RSF has used its (generally smaller) drones both in urban combat, for example in El-Fasher,⁶⁷ and to target cities far from the frontlines that have not seen direct fighting, such as Shendi, Merowe and Gedaref. Even if their attacks have mostly been intercepted,⁶⁸ they have still caused panic among the population,⁶⁹ damaged critical infrastructure such as the Merowe dam power station,⁷⁰ and attempted to draw SAF forces away from the main theatres of combat. The RSF has so far shown less ability to employ drones in coordination with their other capabilities.

The impact of this drone warfare on the conflict dynamics reflects the ways in which the conflict parties compete for battlefield advantage by acquiring superior technological capabilities from foreign sponsors. Although both sides have received weapons from foreign states, the SAF has been able to acquire more sophisticated MALE drones including the training needed for their deployment, whereas the RSF has mainly used smaller loitering munitions and tactical drones with airdrop shells. The SAF's superior access to drones has reinforced its air supremacy. With its significant anti-aircraft capabilities, the SAF has been able to down most of the RSF's drones, while the RSF has used MANPADs to down SAF aircraft in Darfur⁷¹ and drones including a Mohajer-6 in January 2024 and a Zajil 3 three weeks later.⁷² The RSF and the SAF have both also used drone jammers produced in China.⁷³

In Sudan the mostly asymmetric access to and effective deployment of advanced combat drones has had an important impact on conflict dynamics, not least because the parties rely on regular warfare. The topography has mediated this effect to some extent. Because of their relatively short range, the SAF's MALE drones have only been deployed in the largely urban environments of Khartoum and central Sudan, but not against the RSF's supply lines and bases in western and southern Sudan (where the SAF was able to rely on conventional airstrikes anyway). Given the SAF's conventional air dominance it could nonetheless become more difficult for the RSF to maintain long supply lines and assert effective territorial control beyond Darfur. MALE drones could complement the RSF's mechanised infantry capabilities, if it is able to coordinate them effectively with its ground operations. Its drones will also allow the RSF to penetrate deep into SAF-controlled territory, even if the RSF loses complete control of Khartoum, as seem likely. However, the RSF will continue to experience difficulties countering the SAF's significant aerial dominance, unless it is able to acquire more advanced air defence systems or fighter jets, or adjust its tactics to hide from the drones' gaze.

Conclusion

The combination of conditions under which MALE combat drones can significantly shift the balance of military power is rarely found in African conflicts. Combat drones such as those produced by Turkey and Iran can help governments keep insurgents at bay, but only if the

⁶⁷ "Sudanese Army Shoots Down 20 RSF Drones in El Fasher", *Sudan Tribune*, 29 November 2024.

⁶⁸ According to ACLED, in the first eleven months of 2024, only 12 of 56 RSF drone missions struck their target, "Mapping Sudan's Major Conflict Trends in 2024", *ACLED*, 10 December 2024.

⁶⁹ "Drones Attack Sudanese General Intelligence Office in Gadarif", *Al Taghyeer*, 9 April 2024.

⁷⁰ The plant also provides power to Port Sudan, "Drone Attack on Merowe Dam Power Station Disrupts Electricity Supply", *Sudan Tribune*, 13 January 2025.

⁷¹ UN Panel of Experts on Sudan, *Final Report of the Panel of Experts on the Sudan*, 14.

⁷² Abu Taleb, "Evidence of Iran and UAE Drones Used in Sudan War", *BBC News*, 13 June 2024.

⁷³ Amnesty International, *New Weapons Fuelling the Sudan Conflict* (London, 2024), 27.

latter lack access to drones and countermeasures of their own, if the terrain is relatively open, and if the insurgents also fight as a regular force. Where insurgents are able to disperse and conceal themselves, drones can prevent large columns from advancing on a major city, but they cannot stop armed groups from controlling the populations among which they are embedded. So, the impact of advanced combat drones always needs to be viewed through the strategic capabilities and wider characteristics of the warring parties. While symmetrical access to sophisticated combat drones or interception technology is still the exception, the wars in Libya and Sudan indicate that it may become more common as a growing range of foreign states intervene in African conflicts. Where insurgencies without access to drone technologies find themselves battling incumbent governments, they generally resort to guerrilla warfare, which blunts the effectiveness of drones and makes their use potentially counterproductive. By contrast, where open terrain lends a clear advantage to governments operating combat drones, this may well dissuade their adversaries from launching frontal attacks. The strongest impact on the balance of military power may therefore be felt in deterrence and the absence of open warfare, rather than in battlefield dynamics.

Of the three cases presented here, Chad offers the best conditions for drone warfare. Indeed, the Chadian government's decision to eject the French indicates that drone proliferation has changed the balance of power – and foreign relations – in this case. Chad's combination of clear asymmetry of drone access, regular warfare and open terrain may be highly specific. But other conflict settings in northern Africa have seen similar combinations. During Libya's 2019–20 civil war, for example, the Emirati drones and – later – Russian warplanes based in al-Jufra, acted as an effective deterrent. Any attempt by western Libyan forces to capture this crucial base in the middle of the desert would have required them to cross hundreds of kilometres of open terrain, far from the Turkish air defence systems that neutralised Haftar's advantage in air power.⁷⁴ In 2008, the Darfur-based Justice and Equality Movement (JEM) made a daring attempt to capture Khartoum, crossing hundreds of kilometres of desert “traveling swiftly by night and dispersing by day”.⁷⁵ It is doubtful whether such an attempt would have been made, let alone reached the capital, had the Sudanese government possessed today's MALE drones.

The case should not be overstated, however. The added benefit of MALE drones remains limited even in situations where they have reportedly affected battlefield dynamics. In Ethiopia in 2021 drones may have “tipped the balance”⁷⁶ in the fight between the Tigray Defence Forces (TDF) and the Ethiopian National Defence Forces (ENDF) – mainly because the TDF were fighting conventionally, they were easy to spot as their troops advanced across relatively flat terrain, and they had overextended their supply lines.⁷⁷ The same tactic would not have worked if the TDF had withdrawn to the mountains of Tigray and turned to irregular guerrilla warfare. Knowing this, the ENDF was ordered to stop its counter-offensive at the border of Tigray in December 2021. In Mali, Sudan and Ethiopia's Amhara conflict MALE drones have enabled government armed forces to attack insurgent troop concentrations only where insurgents operated openly. But securing victory is a different matter.

These observations represent a snapshot in what a highly dynamic process of proliferation and adaptation. The relatively small number of MALE drones currently available to war-

⁷⁴ Frederic Wehrey, “*This War is Out of Our Hands*” (New America, 2020); Candace Rondeaux, Oliver Imhof and Jack Margolin, *The Abu Dhabi Express* (New America, 2021).

⁷⁵ Alex de Waal, “Making Sense of Khalil's Putsch”, *African Arguments*, 13 May 2008.

⁷⁶ Declan Walsh, “Foreign Drones Tip the Balance in Ethiopia's Civil War”, *New York Times*, 20 December 2021.

⁷⁷ Tom Gardener, *The Abiy Project: God, Power and War in the New Ethiopia* (London: Hurst 2024), 447–48.

ring parties in Africa limits their impact on the battlefield. This will change rapidly in the coming years as more governments buy more drones, technological innovation proceeds apace, and insurgents' access to combat drones and interception systems may also improve. As available air power grows in volume, its use may become more effective or more indiscriminate, with possibly unforeseen consequences for the balance of military power and modes of warfare in African conflicts.

Megatrends Afrika

is a joint project of SWP, IDOS and IfW.

The views expressed in this publication are those of the author(s).

All project publications are subject to an internal peer review process.



This work is licensed under a Creative Commons Attribution 4.0 International License

SWP

Stiftung Wissenschaft und Politik | German Institute for International and Security Affairs

IDOS German Institute of Development and Sustainability

IfW Kiel Institute for the World Economy

www.megatrends-afrika.de

megatrends-afrika@swp-berlin.org

ISSN 2747-4119

DOI 10.18449/2025MTA-PB33

Dr Gerrit Kurtz is a Research Associate in the Africa and Middle East Research Division at SWP.

Dr Wolfram Lacher is a Project Director of Megatrends Afrika and a Senior Associate in the Africa and Middle East Research Division at SWP.

Dr Denis M. Tull is a Project Director of Megatrends Afrika and a Senior Associate in the Africa and Middle East Research Division at SWP.



Funded by:

