Strategic Deployment of Drone in Combating Insecurity in Africa

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Abstract

Insecurity remains one of the most pressing challenges facing Africa, with persistent threats from terrorism, insurgency, banditry, and transnational organized crime. In response, many African states are increasingly turning to advanced technologies, particularly drones, as part of a strategic shift in security operations. This paper examines the strategic deployment of drones in combating insecurity across the continent, highlighting their roles in surveillance, reconnaissance, target acquisition, and tactical operations. Drawing on examples from Nigeria, Somalia, and the Sahel region, the study assesses how drones have improved intelligence gathering, enhanced operational precision, and minimized risks to military personnel. Despite these advantages, the deployment of drones is constrained by issues such as high procurement costs, limited technical capacity, inadequate legal frameworks, and ethical concerns surrounding civilian oversight and data privacy. The paper argues that while drones are not a standalone solution, their integration into national and regional security strategies alongside traditional forces and community-based initiatives can significantly enhance the effectiveness of security interventions. It concludes by recommending increased investment in local drone technology, capacity building, and regional collaboration to ensure sustainable and accountable use of drones in promoting peace and stability in Africa.

Keywords: Drones, Insecurity, Surveillance, Strategic Deployment, Africa

Introduction

Insecurity remains a persistent and growing challenge across much of Africa. The continent continues to grapple with a wide range of security threats including terrorism, armed insurgency, banditry, piracy, human trafficking, and transnational organized crime. These threats undermine national stability, disrupt socio-economic development, and erode public trust in state institutions (Onuoha, 2021). Traditional approaches to combating insecurity such as increased troop deployment, joint military task forces, and bilateral military aid have often yielded limited success due to logistical inefficiencies, corruption, poor intelligence gathering, and the difficult terrains in which many armed groups operate (Mensah, 2020).

As such, African states and regional security actors are increasingly turning to technological innovations to augment their counter-insurgency and security operations. Among these, the strategic deployment of unmanned aerial vehicles (UAVs), commonly referred to as drones, has emerged as a critical tool in the continent's evolving security architecture. Drones offer several advantages over conventional surveillance and combat methods. They are capable of long-endurance flights, real-time data transmission, high-resolution imaging, and precise target acquisition. These capabilities make them especially effective in surveillance missions, border monitoring, early warning systems, and targeted military operations. Moreover, drones can

operate in high-risk areas without exposing human personnel to direct danger, making them ideal for conflict-prone zones where state forces face ambushes or roadside explosives (Almeida & Mlambo, 2022). In addition to military uses, drones have also been deployed in humanitarian and disaster response scenarios, such as post-conflict assessments and delivery of essential supplies to remote or unsafe areas (Obi & Kaba, 2022).

Several African countries have adopted drone technology in their security and counter-terrorism strategies. In Nigeria, drones have been used to monitor the movements of Boko Haram and Islamic State West Africa Province (ISWAP) fighters in the North-East, as part of the Nigerian Air Force's intelligence, surveillance, and reconnaissance (ISR) missions (Onuoha, 2021). In Kenya and Somalia, drones have been integrated into operations by both national forces and African Union Mission in Somalia (AMISOM) to counter Al-Shabaab activities, with some operations supported by U.S. drone surveillance under AFRICOM (Alozie, 2023). In the Sahel region, countries such as Mali, Niger, and Burkina Faso have relied on foreign military partners especially France and the European Union to operate drones as part of the broader regional response to Islamist insurgencies (Obi & Kaba, 2022).

Despite these advances, the use of drones in Africa faces significant limitations and challenges. One of the primary barriers is the high cost of drone procurement, maintenance, and training. Most African countries depend on foreign suppliers for drone technology, which not only increases financial costs but also limits operational autonomy and data sovereignty (Mensah, 2020). Moreover, there is a general lack of indigenous technical expertise to manage drone operations, analyze real-time data effectively, and integrate drone intelligence into actionable field decisions. As a result, the full potential of drone technology is not being realized in many contexts.

In addition, regulatory and ethical issues remain unresolved in several African countries. There are few comprehensive national laws governing drone usage, and existing policies often lack clarity on issues such as airspace control, data protection, civilian oversight, and accountability for misuse (Almeida & Mlambo, 2022). This legal vacuum creates risks of abuse, particularly in authoritarian contexts where drones might be used for domestic surveillance or suppression of dissent under the guise of national security. Furthermore, the reliance on drones raises moral questions about the dehumanization of warfare and the potential for civilian casualties during drone strikes, which can fuel resentment and potentially radicalize local populations (Alozie, 2023).

Nonetheless, the strategic deployment of drones holds immense potential for enhancing Africa's capacity to address insecurity if integrated within a broader security reform agenda. For drone technology to be truly effective, African states must complement it with investments in intelligence systems, cybersecurity infrastructure, and institutional reforms that promote transparency and accountability in security operations. Regional cooperation is also essential, as insecurity in Africa often transcends national boundaries. Initiatives such as the Multinational Joint Task Force (MNJTF) against Boko Haram and the G5 Sahel Joint Force must consider harmonizing drone operations, sharing surveillance data, and building joint drone command centers to maximize operational efficiency and intelligence sharing (Obi & Kaba, 2022).

Furthermore, there is a growing need for African countries to invest in domestic research and development of drone technologies. Countries like South Africa and Rwanda have made significant progress in local drone innovation, particularly in civil and health sectors, and such expertise can be extended to the security domain. By developing homegrown drone industries, African states can reduce dependency on foreign actors, lower long-term costs, and tailor technology to local needs (Mensah, 2020).

While the technology is not without its limitations, its potential to improve surveillance, minimize combat risks, and increase operational precision is undeniable. For drones to effectively contribute to peace and stability, however, African countries must adopt a holistic approach investing not only in the technology itself but also in the institutional, legal, and ethical frameworks that govern its use. The future of drone deployment in Africa lies in the ability of governments, regional bodies, and local communities to balance innovation with accountability in the pursuit of security and peace.

Conceptual Review

Drones (Unmanned Aerial Vehicles – UAVs)

Drones, formally known as Unmanned Aerial Vehicles (UAVs), are aircraft systems operated without an onboard human pilot. These systems are controlled either remotely by a human operator or autonomously by onboard computers (Austin, 2010). Originally developed for military use, drones have expanded into various civil, commercial, and research domains due to advances in navigation, sensors, and wireless communication technologies.

UAVs are defined as any powered aerial vehicles that do not carry a human operator, use aerodynamic forces to provide lift, and can fly autonomously or be piloted remotely (Valavanis & Vachtsevanos, 2015). There are several types of UAVs categorized based on size, range, and use. These include micro drones, tactical drones, strategic drones, and large-scale combat UAVs. Civilian applications often use quadcopters and fixed-wing drones for photography, mapping, and surveillance. Drones consist of several components: an airframe, propulsion system, navigation and control systems, and payload (Colomina & Molina, 2014). Technological advancements in GPS, gyroscopes, accelerometers, and real-time data transmission have significantly enhanced UAV efficiency and autonomy. The integration of Artificial Intelligence (AI) and Machine Learning (ML) is also revolutionizing UAV capabilities, enabling intelligent path planning, object recognition, and real-time decision-making (Zhang et al., 2021).

Drones are broadly categorized into civil and military types. In the security domain, drones are used for intelligence, surveillance, reconnaissance (ISR), and in some cases, for lethal operations such as targeted airstrikes (Almeida & Mlambo, 2022). In Africa, the use of drones has expanded in both scope and sophistication, especially in countries facing asymmetric warfare and terrorism. Militarized drones have been deployed in Nigeria, Somalia, Libya, and the Sahel to track insurgents and protect strategic assets. Civil drones have also been adapted for border patrol, pipeline surveillance, and disaster response.

Strategic Deployment

Strategic deployment refers to the planned, systematic, and efficient positioning of resources in this case, drone systems to achieve specific operational or tactical objectives. This involves

decisions on when, where, and how to deploy drones to maximize surveillance, combat capabilities, or defensive coverage (Obi & Kaba, 2022). In security contexts, strategic deployment is not merely about placing drones in the air; it includes intelligence integration, data processing, command-and-control coordination, and target prioritization. Effective strategic deployment ensures that drones enhance situational awareness, provide timely intelligence, and support proactive intervention strategies.

In military operations, strategic drone deployment enhances surveillance, reconnaissance, target acquisition, and strike capabilities. Countries strategically deploy drones to monitor borders, detect threats, and conduct precision strikes with reduced personnel risk (Singer, 2009). UAVs such as the MQ-9 Reaper and Bayraktar TB2 have been pivotal in modern warfare, allowing states to project power while minimizing human and political costs (Shaw, 2016). Drones also play a strategic deterrence role demonstrating aerial superiority and intelligence capabilities to adversaries. Autonomous UAV swarms are being explored for strategic saturation attacks and defensive countermeasures (Zhang et al., 2021).

Insecurity in Africa

Insecurity in Africa is multifaceted, ranging from insurgencies (e.g., Boko Haram, Al-Shabaab) and banditry to political violence and transnational crime. It is exacerbated by factors such as weak state capacity, poverty, poor governance, and porous borders (Onuoha, 2021). The continent's vast and often inaccessible terrain makes traditional security responses difficult, creating a strategic gap that drone technology seeks to fill. Drones can reduce insecurity by offering persistent surveillance, monitoring high-risk zones, providing early warnings, and deterring criminal activities. However, their effectiveness is influenced by the broader security infrastructure, technical proficiency, and institutional preparedness of the deploying nation.

Insecurity remains one of Africa's most persistent challenges, manifesting through terrorism, banditry, armed conflicts, piracy, and transnational crimes. The vastness of the continent, coupled with porous borders and inadequate security infrastructure, has made surveillance and rapid response a major challenge for governments. Against this backdrop, the strategic deployment of Unmanned Aerial Vehicles (UAVs), or drones, is increasingly seen as a viable tool to address and mitigate these threats (Adejoh, 2022). Insecurity in Africa takes many forms. The Sahel region grapples with insurgency from groups like Boko Haram and Islamic State affiliates. East Africa faces threats from Al-Shabaab in Somalia and Kenya, while West Africa contends with cross-border banditry and kidnapping, particularly in Nigeria, Niger, and Mali (Onuoha, 2018). Piracy in the Gulf of Guinea and conflicts in the Horn of Africa further exacerbate instability. These complex, mobile, and asymmetric threats often require unconventional and technologically advanced responses an area where drones are becoming strategically indispensable.

Security Governance

Security governance refers to the ways in which state and non-state actors manage and regulate security provision, including the formulation of security policies**,** control of military technologies**,** and oversight of force usage. In the context of drone deployment, good security governance involves having clear legal frameworks**,** accountability mechanisms**,** and civilian oversight to prevent abuse and ensure ethical conduct (Mensah, 2020). Africa's security

landscape is marked by fragmented authority, weak institutions, porous borders, and a proliferation of non-state armed actors. In this context, effective security governance demands collaborative frameworks, multi-actor coordination, and adaptive tools for intelligence and operational effectiveness (Bryden & Olonisakin, 2010). Drones, when strategically deployed, can support these goals by improving surveillance, intelligence gathering, early warning systems, and operational deployment in areas where conventional policing or military presence is difficult.

In many African countries, the use of drones has outpaced regulatory development, raising concerns over surveillance overreach, misuse of military force, and lack of public transparency. Therefore, effective security governance is necessary to balance technological innovation with human rights protection and democratic accountability. The strategic deployment of drones is best understood as the intersection of technology**,** military strategy**,** and security governance**.** In a region facing persistent threats and limited conventional resources, drones offer a force multiplier effect. However, their use must be governed by sound strategic planning**,** trained personnel**,** robust legal oversight**,** and regional coordination mechanisms**.** Furthermore, a drone strategy must be integrated with broader intelligence-sharing systems**,** counter-radicalization programs**,** and community-based security frameworks to be sustainable and effective. This conceptual link underscores that drone deployment alone is insufficient unless embedded within a holistic approach to African security challenges.

This conceptual review demonstrates that while drones represent a critical technological asset in modern security operations, their deployment must be strategic, regulated, and integrated within broader frameworks of governance and regional cooperation. In Africa's complex and evolving security environment, these conceptual foundations offer the basis for evaluating both the promise and the pitfalls of drone-based interventions.

Empirical Review of Literature

The use of drone technology in addressing security challenges has attracted growing scholarly interest across Africa. Several empirical studies have examined the effectiveness, limitations, and governance of unmanned aerial vehicles (UAVs) in surveillance and combat roles. Almeida and Mlambo (2022) conducted a comparative study of drone deployment in the Sahel, specifically within French-led Operation Barkhane. Their findings showed that drones significantly enhanced the precision of airstrikes and the monitoring of terrorist movements in hard-to-reach terrains. However, the study also revealed a dependency on foreign technology and military coordination, which limits the autonomy of African states in security operations.

Onuoha (2021) evaluated Nigeria's use of ISR drones in counterinsurgency against Boko Haram. The study revealed that while drones provided crucial real-time data on insurgent movement, operational success was undermined by poor inter-agency coordination, limited drone flight ranges, and insufficient analysis of aerial data due to technical manpower shortages. Alozie (2023) assessed the integration of drone technology in East African counterterrorism efforts, especially in Kenya and Somalia. Through interviews with security experts and drone operators, the study found that drones helped reduce casualties in direct combat and enhanced monitoring of terror hotspots. Nonetheless, the lack of legislative oversight and concerns over privacy violations were highlighted as key constraints.

Mensah (2020) analyzed how African militaries use drones as part of broader security intelligence reforms. His mixed-methods study based on field surveys in Ghana and Ethiopia demonstrated that while drones increased surveillance capabilities, their effectiveness was closely tied to broader institutional factors such as training, digital infrastructure, and political will. Obi and Kaba (2022) examined multilateral drone operations in the G5 Sahel and noted that collaborative frameworks, such as intelligence sharing and joint air patrols, were vital in maximizing drone efficiency. However, they also identified fragmentation among member states and unequal access to drone systems as obstacles to sustainable regional success. While existing empirical studies have significantly contributed to our understanding of drone deployment in Africa, several key gaps remain: Most empirical studies focus on specific regions or countries (e.g., Nigeria, Somalia, the Sahel), with limited comparative analysis across Africa. This restricts the generalizability of findings and the identification of best practices applicable at a continental level.

Current literature often centers on drones imported from global powers, with little attention to the role of African tech startups and universities in developing localized drone solutions for security purposes. Few studies fully explore how institutional weaknesses such as inadequate legal frameworks, poor inter-agency collaboration, and low accountability hinder the effectiveness of drone deployments. Although empirical literature confirms the value of drones in enhancing surveillance and operational efficiency in Africa's security landscape, their deployment remains constrained by institutional, ethical, and technological challenges. In the light of the forgoing, this study seeks to fill the identified gaps by offering a broader continental perspective, exploring institutional frameworks, and integrating civilian perceptions to inform the strategic, ethical, and sustainable use of drones in combating insecurity in Africa.

Theoretical Framework

This study is grounded in two interrelated theories that provide a comprehensive lens for analyzing the strategic, ethical, and sustainable use of drone technology in addressing insecurity across Africa: Technological Determinism posits that technological innovations shape and drive changes in society, governance, and behavior (Smith & Marx, 1994). In the context of security, this theory suggests that the adoption of advanced technologies like drones fundamentally transforms how states confront insecurity, monitor territories, and manage warfare. Applied to Africa, this theory helps explain how drone technology is reshaping military tactics, surveillance strategies, and inter-state security cooperation. It also supports the argument that technology can outpace institutional readiness, resulting in governance gaps, misuse, or ethical dilemmas. Therefore, the theory underlines the need for policy, legal, and institutional adaptations to effectively integrate drones into security architectures.

Institutional Theory focuses on how structures, rules, norms, and routines shape the behavior of organizations (Scott, 2008). It emphasizes that successful adoption and use of any technology especially in complex sectors like national security depend heavily on the strength and coherence of institutions. In this study, Institutional Theory is used to explore how the effectiveness of drone deployment is mediated by factors such as legal frameworks, bureaucratic coordination, human capacity, and regulatory oversight. Weak institutions can undermine even the most advanced technologies, while robust institutions enable strategic and ethical use. This theory also

supports the study's emphasis on regional cooperation and standardized regulatory frameworks across African countries to ensure coherent drone governance.

By combining Technological Determinism and Institutional Theory, the study provides a dual perspective: Technological Determinism highlights the transformative potential and security utility of drones. Institutional Theory underscores the importance of governance, ethics, and systemic readiness in realizing this potential. This theoretical synergy allows the study to examine not only how drones can change the landscape of security operations in Africa but also what systemic conditions are necessary for their success, legitimacy, and sustainability.

Strategic, Institutional and Civilian Perspectives Drone Deployment in Africa's Security Landscape

Much of the existing research on drone deployment in Africa focuses on isolated cases or regions, such as Nigeria's fight against Boko Haram or counterterrorism in Somalia and the Sahel. This fragmented approach limits understanding of the diversity of security challenges and technological adaptations across the continent. A continental perspective involves comparative analysis across different African countries and sub-regions to identify common trends, unique adaptations, and best practices in drone deployment. This approach recognizes the heterogeneity of Africa's security landscape ranging from urban terrorism to rural banditry and the diverse political, economic, and geographic conditions that shape drone use.

By broadening the scope, this study can illuminate how factors such as political stability, military capacity, and regional cooperation influence drone effectiveness. Moreover, it can highlight how cross-border threats necessitate coordinated drone operations and shared intelligence frameworks across African Union member states and regional blocs (Obi & Kaba, 2022). This will help policy-makers understand where to invest resources and how to build interoperable drone networks that enhance collective security.

Drones operate within complex institutional environments that include military hierarchies, government agencies, legal systems, and international partnerships. A critical gap in current research is the in-depth exploration of these institutional frameworks and how they enable or hinder drone deployment. This theme involves assessing the existing policies regulating drone procurement, deployment, data management, and oversight in African states. It includes examining the clarity and adequacy of legal frameworks governing airspace control, privacy protections, and accountability for drone operations (Mensah, 2020).

Understanding institutional capacity is also vital covering issues such as technical training, command and control mechanisms, inter-agency coordination, and the integration of drone data into actionable intelligence. Institutional weaknesses can lead to inefficiencies, misuse, or failure to fully exploit drone capabilities. This study will also investigate regional and multilateral governance structures such as the African Union and G5 Sahel and their role in harmonizing drone policies, facilitating intelligence sharing, and promoting joint drone operations (Obi & Kaba, 2022). These insights will inform recommendations for strengthening institutional environments to enable ethical, effective, and sustainable drone use.

Security interventions that neglect the views and experiences of affected communities often face resistance and can exacerbate instability. Civilian perceptions of drone use particularly concerns over surveillance, privacy, and potential collateral damage are under-researched but critical to sustainable security outcomes. This study focuses on capturing community attitudes towards drone surveillance and strikes, exploring how drones impact local notions of safety, trust in security forces, and perceptions of state legitimacy (Alozie, 2023). It also considers fears of constant monitoring or mistaken targeting that might fuel grievances or radicalization. By integrating civilian perspectives, this study aims to promote a people-centered approach to drone deployment, where technology serves to protect rather than alienate communities. It highlights the importance of transparency, communication, and accountability mechanisms that address local concerns and build public confidence.

Moreover, understanding gendered impacts and human rights implications of drone usage is crucial for ethical security governance. This includes assessing whether drone operations disproportionately affect vulnerable groups and how safeguards can be put in place. By combining a continental outlook, institutional analysis, and community insights, this study contributes to a holistic understanding of drone deployment in Africa's security sector. Strategically, it will identify how drone capabilities can be optimized in different security contexts and integrated into broader counter-insurgency, border security, and intelligence frameworks.

Ethically, it emphasizes the need for frameworks that respect human rights, safeguard civilian populations, and ensure accountability for drone operations, mitigating risks of abuse or excessive use of force. Sustainably**,** it advocates for building local capacity, including technical expertise and domestic drone manufacturing, to reduce dependence on foreign actors and enable long-term operational viability. It also promotes regional cooperation to address shared security challenges efficiently. Together, this study position drones technology not as a standalone solution but as part of a comprehensive security governance model that balances technological innovation with institutional robustness and community trust.

Conclusion

The strategic deployment of drones in Africa presents a promising avenue for enhancing national and regional responses to growing insecurity. As demonstrated across empirical and conceptual discussions, drones offer significant advantages in surveillance, precision targeting, and intelligence gathering—especially in hard-to-reach or volatile conflict zones. However, their full potential is yet to be realized due to fragmented institutional structures, limited local capacity, weak legal frameworks, and minimal community engagement. This study has addressed key gaps by offering a broader continental perspective that underscores the need for inter-state collaboration and knowledge exchange in the use of drone technology. It has also emphasized the importance of strong institutional frameworks that include clear regulatory policies, skilled human resources, and inter-agency coordination.

Equally critical is the integration of civilian perceptions ensuring that drone operations are transparent, respectful of privacy and rights, and grounded in ethical norms. Ultimately, the sustainable and ethical use of drones in Africa's security architecture must be informed by a balanced approach that leverages technology while reinforcing governance, accountability, and

public trust. Future policy directions should prioritize capacity building, community engagement, and harmonized legal instruments across the continent. With these measures in place, drone technology can move from being a tactical tool to a strategic pillar of peace and security in Africa.

Recommendations

i. African governments should develop comprehensive policies and legal guidelines governing drone acquisition, deployment, airspace management, and accountability. This includes creating clear protocols for inter-agency cooperation, data protection, and adherence to international humanitarian law.

ii. Regional bodies like the African Union (AU), ECOWAS, and IGAD should coordinate drone-based security efforts across borders, especially in addressing transnational threats like terrorism, insurgency, and smuggling. Shared drone operations and real-time intelligence exchange can enhance collective security outcomes.

iii. Governments and private sectors should prioritize investment in indigenous drone production, maintenance, and training. This reduces dependence on foreign technology and builds a sustainable ecosystem of skilled professionals capable of managing drone operations locally.

iv. Drone programs must involve civilian oversight bodies and community representatives to ensure transparency and public trust. Engaging communities in dialogue about drone missions can improve legitimacy, reduce fear, and foster better civilian-military cooperation.

v. Drone deployment should always be guided by ethical principles and human rights norms. States must implement strict rules of engagement, protect non-combatants, and establish mechanisms to investigate and redress violations related to drone operations.

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