

NOMADIC INFLUX AND RURAL BANDITRY IN NORTH-CENTRAL REGION OF NIGERIA: A TECHNOLOGICAL SOLUTION, 2015 – 2024

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Abstract

The North-Central region of Nigeria has experienced a significant increase in rural banditry, attributed mainly to nomadic influx and the resultant socio-economic conflicts. This study employed Routine Activity Theory to examine the intersection between nomadic movements and the rise in rural banditry, focusing on technological advancements, such as drone technology and the Global Positioning System (GPS), to mitigate these security challenges. The study adopted a mixed-methods research design, with a sample of 1200 respondents selected from 20 communities in Benue and Nasarawa States, and 16 key informant interviews were purposively selected. The instruments for data collection were questionnaires and key informant interviews. The quantitative data retrieved were analysed using simple linear regression, while the qualitative data were analysed through transcription. Results show a significant relationship between the deployment of drone technology and the Geographic Positioning System (GPS) and the control of rural banditry in Nigeria's North-Central Region. The study concludes that while technological interventions offer promising solutions, their success depends on sustained investment, capacity building, and the cooperation of all stakeholders. This study contributes to the ongoing discourse on rural security in Nigeria by proposing practical and innovative approaches to counter the threats posed by rural banditry in the North-Central region.

Keywords: *Drone technology, geographic positioning system, nomadic influx, rural banditry*

Introduction

Seasonal movements across vast distances characterize the nomadic lifestyle of pastoralists in search of grazing lands. In Nigeria, the Fulani herders represent the largest group of nomadic pastoralists, and their movements have historically been peaceful. However, in recent years, the dynamics of these movements have changed, mainly due to environmental degradation, which has led to the depletion of grazing lands and water sources in the northern parts of the country. As a result, the Fulani herders have increasingly moved southward, leading to heightened competition with local farming communities over land and water resources¹. The north-central region of Nigeria has been a hotspot for conflict and insecurity, driven by a complex interplay of socio-economic, environmental, and political factors. One of the most pressing challenges faced by this region is rural banditry, which has escalated in frequency and intensity over the past decade. Banditry in rural areas involves acts of armed robbery, kidnapping for ransom, cattle rustling, and violent confrontations, predominantly affecting agrarian communities. These activities have severely disrupted the socio-economic fabric of rural life, leading to loss of lives, destruction of property, and displacement of large numbers of people².

The influx of nomadic populations, particularly Fulani pastoralists, into the North-Central region has been identified as a significant factor contributing to the rise in rural banditry. Traditionally, these nomads have migrated seasonally in search of pasture and water for their livestock. However, the growing pressures of desertification, climate change, and population

¹ M. Bello. "Technological Interventions for Rural Security in Nigeria: The Role of Drones and Surveillance Systems". *Security Journal of Africa* 9, no. 1 (2023): 67.

² A. Abubakar. "Nomadic Influx and Rural Banditry in North-Central Nigeria: A Critical Analysis". *Journal of Conflict Studies* 5, no. 2 (2022): 123.

growth have intensified competition for scarce natural resources, leading to conflicts between nomadic herders and sedentary farming communities. These conflicts often become violent, resulting in widespread insecurity and banditry³. Given the limitations of traditional security measures and the growing sophistication of banditry, there is a pressing need to explore innovative technological solutions that can effectively address this menace. Technologies such as drone technology and Geographic Positioning Systems (GPS) have emerged as promising tools for enhancing security and preventing rural banditry. These technologies offer the potential to monitor vast rural areas, track the movements of nomadic populations, and respond swiftly to security threats. It is against this background that this research aims to validate the following research questions:

1. How are drone technology solutions used to curb rural banditry in the North-Central region of Nigeria?
2. To what extent does the use of Geographic Positioning Systems (GPS) help control rural banditry in the North-Central region of Nigeria?
3. What are the challenges facing the use of technology in the fight against rural banditry in the North-Central region of Nigeria?

Objectives: The specific aims of this study are to;

1. Investigate how drone technology solutions are used to curb rural banditry in the North-Central region of Nigeria.

³ E. Nwankwo. *The Impact of Nomadic Movements on Rural Security in North-Central Nigeria*. African Security Review 28, no. 1 (2023): 102.

2. Determine the extent to which the Geographic Positioning Systems (GPS) are used to control rural banditry in the North-Central region of Nigeria?
3. Identify the challenges facing the use of technology in the fight against rural banditry in the North-Central region of Nigeria.

Theoretical Framework

The study adopted the Routine Activities Theory (RAT). The Routine Activities Theory was developed by criminologists Lawrence Cohen and Marcus Felson in 1979. The theory posits that for a crime to occur, three elements must converge in time and space:

- i. **A motivated offender:** Someone willing and capable of committing a crime.
- ii. **A suitable target:** A person, object, or place vulnerable to victimization.
- iii. **The absence of capable guardians** represents the lack of adequate measures or individuals to prevent the crime, such as law enforcement, community watch, or technological interventions.

The theory applies to this study because the influx of nomads into the North-Central region, driven by environmental changes, economic hardship, and resource conflicts, has created a population of individuals who may become motivated offenders. The displacement and lack of stable livelihoods among some nomadic groups can increase the likelihood of engaging in criminal activities, including rural banditry. Rural communities in North-Central Nigeria often serve as suitable targets due to their relative isolation, insecurity, and valuable resources such as livestock, crops, and other assets. These communities may be perceived as easy targets by bandits seeking economic gain. The lack of effective policing, surveillance, and security measures in these rural areas contributes to the high incidence of banditry. The absence of technological solutions such as

surveillance drones, early warning systems, and communication networks exacerbates the situation, leaving communities vulnerable to attacks.

Using data analytics to identify patterns and predict potential banditry hotspots can help strategically deploy resources. Predictive policing allows law enforcement agencies to focus on areas with the highest risk of criminal activity. Empowering local communities with technology, such as mobile apps for reporting incidents and community-operated surveillance systems, can enhance the overall security environment and reduce rural communities' vulnerability to banditry. By applying the Routine Activities Theory to the context of nomadic influx and rural banditry in North-Central Nigeria, it becomes clear that technological solutions can play a crucial role in enhancing the “capable guardianship” of these areas. Through the deployment of drones, improved communication networks, and data-driven policing strategies, the region can better protect itself from the threats posed by rural banditry.

Banditry in the North-Central region of Nigeria

Shifting movement patterns are noted by some as a key part of the explanation for the increase in pastoralist-related rural banditry, as pastoralists are now going “where they have never travelled before,” thereby driving their livestock into farming lands⁴. As demonstrated by various studies included in this review, pastoral movement patterns have changed significantly in recent decades, both geographically and in timing⁵. Drought, which is affected by regional climate change, has been shown to alter livestock movements, potentially leading to local-level rural

⁴ A. McGregor. *The Fulani Crisis: Communal Violence and Radicalism in the Sahel*. Combating Terrorism Center, West Point, 10, no. 2 (2017).59

⁵ A. Serge, and P. Goutin. *Réflexion sur l'évolution de la mobilité des pasteurs nomades au Tchad*. Nomadic Peoples 17, no. 1 (2013)19.

banditry⁶. Other environmental events and patterns have also been associated with shifting movements. In South Sudan, flooding has also played a significant role in shifting the movement of pastoralist populations, as was observed in 2019 with the internal displacement of cattle camps into Equatorial⁷. In the Central African Republic (CAR), the expansion of pastoralist livestock production has continued to the country's southern border with the Democratic Republic of Congo (DRC), driven in part by insecurity in the north but also by the attraction of abundant grazing resources⁸.

Shifting pastoral movements can cause friction and sometimes lead to rural banditry, but these shifts are not always a sudden response to climate shocks and may be related to longer-term adaptations, as pastoralism is an inherently adaptive practice. Transhumance movements and livestock production more generally can shift southward as pastoral groups seek new grazing opportunities in sub-humid areas or new markets, and through livelihood diversification into trading and agriculture⁹. In places like Côte d'Ivoire, Nigeria, and the CAR, the introduction of pastoral livestock into sub-humid frontier areas dates back several decades and was driven by market demand and government policy to promote domestic livestock production¹⁰.

⁶ A. A Augustine, A. A. *Transhumant Pastoralism, Sustainable Management of Natural Resources and Endemic Ruminant Livestock in the Sub-Humid Zone of West Africa*. Environment, Development and Sustainability 16, no. 5 (2014).79

⁷ T. Nhial. *Resolving Climate Change-Induced Migration and Conflict in South Sudan*. Africa Portal, 2020, p.102.

⁸ A. Guy-Florent. *Insécurité, mobilité et migration des éleveurs dans les savanes d'Afrique centrale*. Paper presented at *Savanes africaines en développement: Innover pour durer*, Garoua, Cameroon, 2009.99

⁹ J. B Thomas and M. D. Turner. "Sudden Shift or Migratory Drift? Fulbe Herd Movements to the Sudano-Guinean Region of West Africa," *Human Ecology* 35, no. 1 (2007), p. 76

¹⁰ B. Bernard. *Contribution à la relance du dialogue local à Berbérati*. Paris: IRAM, 2017. p. 35

Nomadic practices in the Sahel and Sahara have been the mainstay of the nomadic way of life¹¹. The arid nature of the Sahel and Sahara creates scarce and contested access to rangeland vegetation. Therefore, the scarcity of limited resources for herds as a result of drought and desertification necessitates southward migration into humid territories that are already overcrowded with a population that predominantly engages in farming¹². This leads to competition between Fulani herdsmen and farmers and, subsequently, confrontation, civil strife, violence, and insurgency, especially in communities where a symbiotic relationship between the Fulani herdsmen and farmers is difficult¹³. The reason for the violent conflict is informed by the consequent crop and soil damages in rural communities where the cattle are grazing¹⁴.

In North-central Nigeria, there has been a dramatic increase in the spates of rural banditry between nomadic herders and farming communities, alongside the attendant problems of rural banditry. This increase in conflict results from increasing sedentarisation along grazing routes. Increased sedentarisation could be seen as a pastoralist community's response to the numerous challenges and constraints they are facing; sedentarisation has been one means of adapting to changing conditions over time. This is what Egwu¹⁵ identifies as a part of expanding the spatial

¹¹ C. De Haan. *Pastoralism Development in the Sahel: A Road to Stability?* Washington, DC, 2016.45

¹² N. E Lenshie and P. K. Jacob. "Nomadic Migration and Rural Violence in Nigeria: Interrogating the Conflicts between Fulani Herdsmen and Farmers in Taraba State." *Ethnic Studies Review* 43, no. 1 (2020): 64.

¹³ A. Okoli. *Cows, Cash and Terror: How Cattle Rustling Proceeds Fuel Boko Haram Insurgency in Nigeria*. CODESRIA Policy Dialogue Conference, Bamako, October 19–20, 2017.105

¹⁴ N. E Lenshie and P. K. Jacob. "Nomadic Migration and Rural Violence in Nigeria: Interrogating the Conflicts between Fulani Herdsmen and Farmers in Taraba State." *Ethnic Studies Review* 43, no. 1 (2020): 64.

¹⁵ S. Egwu. "The Political Economy of Rural Banditry in Contemporary Nigeria." In *Rural Banditry and Conflicts in Northern Nigeria*, edited by J. Mohammed, J. Kuna, and J. Ibrahim. Abuja: Centre for Democracy and Development, 2016.89

scale of exploitation, or the uncanny ability to survive and sometimes prosper under considerable adversity.

In his study on the root causes of the upsurge in farmer-herder conflict, a case study on Middle-Belt Nigeria, Yamusa¹⁶ observed that ecology and environmental causes or climate change have also been the most popular and addressed causes of the overriding cause in the rise of the frequent occurrence of conflicts in the Middle Belt. There is also a fusion of other environmental forces in Nigeria, especially desertification, with various issues like lack of rainfall or drought. In fact, the rainy season is identified as the most intense period of confrontations between nomadic farmers and land farmers. Other activities, such as the movement of herders from one part of Nigeria to the other, also called transhumance, and even the flock of herders due to desertification from border countries like Niger into Nigeria, create scarcity of land. As a result, competition between the farmers and the herders based on land is created to cultivate and pastureland for the animals because of limited land. Urbanization has been a contributing factor as buildings are being erected, causing a reduction in land for pasturing and farming.

Unfortunately, this has given rise to misconceptions regarding the self-inflicted hardships of nomadic herders by an apparent choice of a traditional lifestyle, which inhibits their capacity for innovation and adaptation to change¹⁷. Consequently, there is a negative perception of pastoralists; in the frequent violent conflicts with agricultural farmers, the pastoralists are often blamed for problems related to crop damage, farming along cattle routes, and access to water. As

¹⁶ P. M Yamusa. *The Root Causes of the Upsurge in Farmer-Herder Conflict: A Case Study of Middle-Belt Nigeria*. MA thesis, Near East University, 2022.59

¹⁷ Concept Note. *International Conference on the Future of Transhumance Pastoralism in West and Central Africa*, November 20–24, 2006.78

Okoli¹⁸ has summarized, more often than not, nomadic Fulani herders are perceived to be prone to rural violence. This is the situation of Benue and Nasarawa states, where the herders traversing Benue, Plateau, Niger, Kwara, Nassarawa, Zamfara, Kaduna, Sokoto, Kebbi, and Kano are involved in crimes such as armed robbery, cattle rustling, kidnapping, community invasion, and murder.

Drone technology solution and rural banditry

Rural banditry has emerged as a significant security challenge in Nigeria, particularly in the North-Central region. The phenomenon has escalated in recent years, resulting in the loss of lives, destruction of property, displacement of communities, and disruption of agricultural activities. The complexity of rural banditry in this region is compounded by rugged terrain, lack of infrastructure, and bandits' mobility, making conventional security measures less effective. In response to these challenges, the deployment of drone technology has gained attention as a promising solution for enhancing surveillance, intelligence gathering, and targeted interventions against rural banditry. Drone technology, or Unmanned Aerial Vehicles (UAVs), refers to aircraft systems that operate without a human pilot. Drones have evolved from simple remote-controlled devices to sophisticated systems with advanced sensors, cameras, and communication equipment. In security operations, drones are used for surveillance, reconnaissance, target acquisition, and delivering payloads such as weapons or supplies¹⁹. The adaptability and versatility of drones make

¹⁸ A. Okoli. *Cows, Cash and Terror: How Cattle Rustling Proceeds Fuel Boko Haram Insurgency in Nigeria*. CODESRIA Policy Dialogue Conference, Bamako, October 19–20, 2017.45

¹⁹ R. Finn and D. Wright. *Unmanned Aircraft Systems: Surveillance, Ethics and Privacy in Civil Applications*. Computer Law & Security Review 28, no. 2 (2012): 184.

them valuable tools for monitoring large and inaccessible areas, particularly in challenging terrains like those in the North-Central region of Nigeria.

One of the primary applications of drone technology in controlling rural banditry is surveillance and monitoring. Drones equipped with high-resolution cameras and infrared sensors can provide real-time aerial footage of vast areas, enabling security forces to detect and track the movement of bandits. The ability to monitor remote locations, especially those that are difficult to access by ground patrols, enhances the situational awareness of security agencies and allows for timely interventions²⁰. In addition to surveillance, drones can be used for intelligence gathering by capturing images and videos that can be analysed to identify patterns of bandit activities, hideouts, and supply routes. This information is crucial for planning strategic operations and deploying resources effectively. Using drones for intelligence gathering reduces the reliance on human informants, who may be compromised by fear of reprisal or loyalty to bandits²¹.

Drones also enable targeted interventions by providing precise location data that can be used to coordinate ground or aerial strikes against bandits. This capability is vital in minimizing collateral damage and ensuring that operations are conducted with a high degree of accuracy. For instance, drones can guide airstrikes or direct ground troops to locations where bandits are concentrated²². The North-Central region of Nigeria shares borders with neighbouring countries, which poses additional challenges for controlling cross-border banditry. Drones can be deployed

²⁰ O. Akinyemi and O. Oyebanji. *The Role of Technology in Addressing Security Challenges in Nigeria*. African Security Review 29, no. 2 (2020): 138.

²¹E. Ikpe. "Intelligence Gathering and the Role of Technology in Countering Banditry in Nigeria". *Security Studies Journal* 18, no. 3 (2021): 110.

²² S. Musa. "The Use of Drones in Counterterrorism Operations in Nigeria: Implications for Security and Civil Liberties". *African Journal of Conflict Resolution* 19, no. 1 (2019): 63

for border surveillance, monitoring illegal crossings, and detecting the movement of contraband goods, arms, and bandits across the borders. This application is essential for preventing the influx of armed groups and the smuggling of weapons that fuel rural banditry²³.

Despite the potential benefits of drone technology, several technical and operational challenges limit its effectiveness in controlling rural banditry. These challenges include drones' limited flight range and battery life, which restricts their ability to cover large areas for extended periods. Additionally, adverse weather conditions, such as heavy rain or strong winds, can affect the performance of drones and reduce their reliability²⁴. The deployment of drones for security purposes also raises regulatory and legal issues, particularly concerning privacy rights, airspace management, and the use of armed drones. In Nigeria, the regulatory framework for drone operations is still evolving, and there are concerns about the potential misuse of drones for unauthorized surveillance or extrajudicial killings. Ensuring drone operations comply with legal standards and respect for human rights is essential for maintaining public trust and legitimacy²⁵.

The cost of acquiring, maintaining, and operating drones is another significant challenge, especially in a resource-constrained environment like Nigeria. While drones offer a cost-effective alternative to manned aircraft, the initial investment and ongoing operational costs can be prohibitive for security agencies with limited budgets. Furthermore, the sustainability of drone

²³ C. Nwokolo and O. Afolabi. *Cross-Border Banditry and Regional Security in West Africa: The Role of UAV Technology*. West African Security Review 16, no. 2 (2017): 68.

²⁴ D. Olaniyan. "Challenges and Opportunities in Using Drone Technology for Rural Security in Nigeria". *Journal of African Technology Studies* 14, no. 2 (2020): 71

²⁵ M. Adeleke. "Regulating Drone Operations in Nigeria: Legal and Policy Considerations". *Nigerian Journal of Law and Technology* 12, no. 1 (2021): 45

operations requires continuous funding, personnel training, and infrastructure development²⁶. The use of drones in security operations also raises ethical considerations, particularly concerning the potential for civilian casualties and the erosion of civil liberties. The deployment of armed drones, in particular, has sparked debates about the ethics of remote warfare and the risk of dehumanizing conflict. Balancing the need for security with ethical considerations is a critical challenge that must be addressed in drone technology²⁷.

Integrating drone technology into security operations in the North-Central region of Nigeria has significant implications for policy and practice. First, there is a need for a comprehensive regulatory framework that governs the use of drones, ensuring that their deployment is transparent, accountable, and aligned with human rights standards. Second, the success of drone operations depends on the availability of trained personnel who can operate and maintain the technology effectively. This requires investment in capacity-building and technical training for security agencies. Third, collaboration between security agencies, local communities, and international partners is essential for maximizing the impact of drone technology in controlling rural banditry. Such collaboration can facilitate information sharing, joint operations, and access to advanced technology and expertise²⁸. Drone technology offers a promising solution for controlling rural banditry in the North-Central region of Nigeria, with applications ranging from

²⁶ T. Oladipo. "Cost-Benefit Analysis of Drone Technology in Security Operations in Nigeria". *Journal of Defense Economics* 11, no. 3 (2018): 23.

²⁷ R. Finn and D. Wright. *Unmanned Aircraft Systems: Surveillance, Ethics and Privacy in Civil Applications*. Computer Law & Security Review 28, no. 2 (2012): 184.

²⁸ M. Adeleke. "Regulating Drone Operations in Nigeria: Legal and Policy Considerations". *Nigerian Journal of Law and Technology* 12, no. 1 (2021): 45.

surveillance and intelligence gathering to targeted interventions and border surveillance. However, the effectiveness of drones is contingent on overcoming technical, operational, regulatory, and ethical challenges. To fully harness the potential of drone technology, there is a need for a holistic approach that integrates technological innovation with sound policy, capacity-building, and ethical considerations. As Nigeria continues to grapple with the challenges of rural banditry, the strategic deployment of drones can play a crucial role in enhancing security and promoting stability in the region.

Geographic Positioning Systems (GPS) and rural banditry

Traditional methods of policing and community protection have proven inadequate in addressing these challenges, leading to the exploration of technological solutions, including the use of Geographic Positioning Systems (GPS). GPS technology offers real-time location tracking, mapping, and surveillance capabilities, which can be leveraged to enhance the control and mitigation of rural banditry. This literature review examines the application of GPS technology in controlling rural banditry, focusing on its effectiveness, challenges, and potential for future implementation in the North-Central region of Nigeria.

Geographic Positioning Systems (GPS) have been widely recognized as a critical tool in modern security management. According to Steinberg et al.²⁹, GPS technology enables the precise tracking of movements and locations, which is essential for monitoring criminal activities in real-time. In rural banditry, GPS can be deployed to track the movements of suspected bandits, monitor cattle herds, and secure transportation routes. The ability to provide accurate and timely

²⁹ M. Steinberg. “*The Role of GPS in Modern Security Management*”. *International Security Journal* Vol. 22, no. 4 (2019): 312.

information to security agencies allows for quicker response times and more effective interventions. Studies have shown that GPS technology can significantly reduce the occurrence of rural banditry by enhancing surveillance and intelligence gathering. For instance, Musa and Ibrahim³⁰ argue that GPS tracking devices can be attached to livestock to monitor their movements and alert authorities in case of theft. This approach has been successfully implemented in regions with similar challenges, such as the Sahel region in West Africa, where cattle rustling has been curbed through GPS-enabled tracking systems³¹.

The implementation of GPS technology in the north-central region of Nigeria has had mixed results. On the one hand, there have been successful cases where GPS tracking has led to the recovery of stolen livestock and the apprehension of bandits. On the other hand, significant challenges have hindered the widespread adoption of this technology. One of the primary challenges is the need for more infrastructure and technical expertise to maintain and operate GPS systems. As highlighted by Nwankwo and Eze³², rural areas in Nigeria often need better network coverage, which can limit the effectiveness of GPS tracking.

Additionally, the high cost of GPS devices and the need for a continuous power supply hinder their use in remote areas. These challenges have been exacerbated by the reluctance of local communities to adopt new technologies, often due to a need for more awareness and trust in

³⁰ K. Musa and L. Ibrahim. "GPS Tracking and Its Role in Reducing Rural Banditry in Nigeria". *Journal of Crime Prevention and Control* 25, no. 3 (2020): 98.

³¹ T. Adebayo. *The Impact of GPS Tracking on Cattle Rustling in the Sahel Region*. African Security Review 30, no. 2 (2021): 145

³² O. Nwankwo and C. Eze. "Technological Barriers to the Adoption of GPS Systems in Rural Nigeria". *Journal of Information Technology in Africa* 14, no. 2 (2018): 105.

technological solutions³³. However, there have been efforts to overcome these barriers through government and non-governmental initiatives. For example, in collaboration with international partners, the Nigerian government has launched pilot projects to equip local security forces with GPS devices and provide training. According to Udo and Hassan³⁴, these initiatives have shown promise in improving the capacity of security agencies to respond to banditry incidents. However, they are still in the early stages of implementation.

Several case studies from the North-Central region provide evidence of the potential of GPS technology in controlling rural banditry. One notable example is the use of GPS tracking in Benue State, where local vigilante groups have been equipped with GPS-enabled devices to monitor movement in remote areas. This initiative, as reported by Adamu and Yusuf³⁵, has led to a significant reduction in cattle rustling incidents and has improved the overall security situation in the affected communities. Similarly, in Nasarawa State, GPS technology has been integrated into a broader security framework that includes drone surveillance and community policing. Combining these technologies has resulted in more effective monitoring of rural areas and has facilitated the coordination of security operations³⁶. The success of these case studies underscores the importance of a multi-faceted approach to security that leverages both technology and community involvement.

³³ R. Okeke. "Community Perceptions of GPS Technology in Rural Nigeria." *Journal of Rural Sociology* 19, no. 3 (2020): 215.

³⁴ J. Udo and I. Hassan. "Government Initiatives in the Deployment of GPS Technology for Rural Security in Nigeria". *Journal of African Security Studies* 11, no. 2 (2022): 145.

³⁵ B. Adamu and M. Yusuf. "Community-Based GPS Tracking as a Tool for Rural Security in Benue State". *Journal of Rural Security Studies* 12, no. 1 (2023): 78.

³⁶ J. Audu. "Integrating GPS Technology with Drone Surveillance for Enhanced Security in Nasarawa State". *International Journal of Security Technology* 18, no. 3 (2023): 200.

Despite the successes, there are still considerable challenges to the widespread adoption of GPS technology in controlling rural banditry in the North-Central region. One of the main issues is the need for sustainable funding to maintain and upgrade GPS systems. As noted by Chukwu and Ojo³⁷, the financial constraints faced by local governments and security agencies have limited the scalability of GPS initiatives. Additionally, integrating GPS technology with other security measures, such as drone surveillance and community policing, requires a coordinated effort often lacking due to bureaucratic inefficiencies and corruption. Furthermore, data privacy and security are growing concerns. The use of GPS tracking raises questions about the protection of personal information and the potential for abuse by authorities. Ensuring that GPS technology is used ethically and transparently is essential for maintaining public trust and support.

Looking ahead, there is a need for continued research and innovation to enhance the effectiveness of GPS technology in rural security. This includes exploring low-cost alternatives to traditional GPS devices, improving network infrastructure, and increasing community engagement in adopting technology. The successful control of rural banditry in the North-Central region will depend on the ability to address these challenges and leverage the full potential of GPS technology. The use of Geographic Positioning Systems (GPS) offers a promising solution to the challenge of rural banditry in the North-Central region of Nigeria. While there have been notable successes in implementing GPS technology, significant challenges remain, particularly in infrastructure, funding, and community acceptance. A comprehensive approach that combines GPS with other technological and community-based measures is essential for effectively controlling rural

³⁷ P. Chukwu and A. Ojo. "Financial Challenges in the Implementation of GPS Technology for Rural Security in Nigeria". *Journal of African Development* 29, no. 4 (2021): 320.

banditry. Future efforts should focus on overcoming the existing barriers to adopting GPS technology and ensuring its integration into a broader security framework.

The challenges of deploying technology in the fight against rural banditry in Nigeria.

Rural banditry in Nigeria, especially in the northwest and North-Central zone, has evolved into a complex, adaptive threat involving kidnapping, cattle rustling, ambushes, and control of ungoverned spaces. Ojo et al.³⁸ argue that technology (drones/UAVs, remote sensing, ICT, satellite communications, geospatial mapping, and mobile reporting platforms) can strengthen intelligence, surveillance, and response. Oyewole et al.³⁹ found that many affected rural areas suffer from poor electricity, sparse cellular coverage, and limited backhaul connectivity conditions that hamper persistent surveillance, real-time video feeds, and reliable remote sensing. Where drone operations or mobile reporting depend on satellite links or cellular networks, outages or low bandwidth reduce both reach and timeliness of actionable intelligence. Studies on ICT in Nigerian security contexts repeatedly highlight that the rural digital divide is a fundamental bottleneck for tech-enabled security models.

High upfront acquisition costs, especially for higher-end ISR drones, satellite subscriptions, and analytic software, are compounded by recurrent expenses: maintenance, spare parts, trained pilots/operators, and fuel or satellite airtime. Ojo et al.⁴⁰ note that a short-term

³⁸ S. O Ojo, S. Oyewole, and F. Aina. *Forces of Terror: Armed Banditry and Insecurity in North-West Nigeria*. Democracy and Security (2023), p. 87

³⁹ Ojo, Oyewole, and Aina. *Forces of Terror...* p. 87

⁴⁰ Ojo, Oyewole, and Aina. *Forces of Terror...* p. 87

procurement without sustained logistics or local training yields underutilized platforms. The lack of indigenous maintenance ecosystems often forces dependence on external vendors, creating delays and higher lifecycle costs. Technology only delivers value when paired with institutional processes that act on information quickly. Nigeria's security architecture involves multiple agencies such as the military, police, civil defence, state vigilante groups, and federal-state overlaps that create ambiguity about responsibility for tech deployments and the use of collected data. Ojo et al⁴¹ show that inter-agency rivalries, unclear chains of command, and poor data-sharing protocols reduce the operational impact of surveillance and mapping tools. Unregulated surveillance, including aerial monitoring and mass collection of community data, raises legal and human rights questions. UN Institute for Disarmament Research⁴² warns that overbroad use of technology without clear safeguards can erode civil liberties and may fuel local backlash or reduce community trust.

Methods

Design, study description, and scope

This study adopted a **mixed-method research design** that integrates qualitative and quantitative approaches. The mixed-method approach will provide a comprehensive understanding of the relationship between nomadic influx, rural banditry, and the effectiveness of technological solutions in the North-Central region of Nigeria. The quantitative aspect was focused on the

⁴¹ S. O Ojo, S. Oyewole, and F. Aina. *Forces of Terror: Armed Banditry and Insecurity in North-West Nigeria*. Democracy and Security (2023), p. 89

⁴² United Nations General Assembly. *Work of the Advisory Board on Disarmament Matters: Report of the Secretary-General*. July 24, 2024.

statistical analysis of data, while the qualitative aspect provided in-depth insights into the lived experiences and perceptions of the affected communities.

The study was conducted in the North-Central region of Nigeria, which includes States like Benue, Plateau, Nasarawa, and Kogi. However, this study considered Benue and Nasarawa States because significant nomadic activities characterize them, and they have experienced recurring incidents of rural banditry. The selection of these States is based on the high prevalence of rural banditry incidents and the presence of nomadic populations. Benue and Nasarawa States have a population of 9,027,300 people, as projected by the National Population Commission (2022), with a total of 36 Local Government Areas.

The sample size of this study was 1200 respondents. The 1200 sample size was derived from Cochran's (1963) sample size determination or formula. A multi-stage sampling technique was employed to select the study sample. First, purposive sampling was used to select Benue and Nasarawa States with high incidences of rural banditry and significant nomadic presence. Secondly, the stratified random sampling was employed to select ten (10) Local Government Areas, namely Obi, Keana, Doma, Awe, Lafia, Guma, Gwer-west, Kwande, Logo, and Agatu in Benue and Nasarawa States, ensuring representation from both heavily affected and less affected areas. Thirdly, a random sample of 1200 respondents was drawn from twenty (20) communities of Benue and Nasarawa States, namely Bature, Tse-Adam, Peverga, GidanSule, Oluji, Agberagba, Kuduku 1, Kuduku 2, Iornia, Usen, Segev, Mbakondu, Mbasohon, Mbapa, Mbabuade, Tseghem, Daudu, Mbashiov, Torkula, and Ortese. In addition, key sixteen (16) informants, such as technology experts and local leaders, were selected for in-depth interviews.

Data analysis

The data obtained from the questionnaires were analysed using inferential statistics. A tool such as the Statistical Package for the Social Sciences (SPSS) was used for simple linear regression analysis to determine the relationship between nomadic influx, rural banditry, and the effectiveness of technological solutions. Thematic analysis was employed to analyse data from interviews. This involved coding the responses, identifying patterns and themes, and interpreting the data to understand the underlying issues and perspectives related to technological solutions for rural banditry.

The study adhered to ethical standards throughout the research process. Informed consent was obtained from all participants, ensuring they were fully aware of the study's objectives, procedures, and right to withdraw at any time. Respondents' identities and personal information were protected, and confidentiality and anonymity were maintained to protect them. Additionally, the study will avoid any harm or discomfort to the participants.

The study faced limitations such as difficulty accessing remote and conflict-prone areas, potential biases in self-reported data, and challenges in ensuring the full cooperation of nomadic groups. These limitations were mitigated through careful planning, the use of local guides and interpreters, and the triangulation of data sources to enhance the validity and reliability of the findings.

Results

Hypothesis 1: There is no significant relationship between drone technology and rural banditry in the North-Central region of Nigeria.

Table 1: Summary of Simple Linear Regressions showing the influence of drone technology on rural banditry in the North-Central Region of Nigeria

Predictor	R	R ²	Df	F	B	T	Sig	Decision
Variable								
Constant	.841	.707	1,175	2826.915	.841	8.104	.000	Significant
Drone technology						53.169	.000	

Source: Fieldwork, 2024.

The result presented in Table 2 showed that geographical positioning systems technology significantly influenced rural banditry in the north-central region of Nigeria. [(R. 841 = R² = .707. F (1, 1, 1755) = 2826.915, P< .05)]. This result indicated that drone technology accounted for 70.7% of the technological solutions of rural banditry as observed in the North-Central Region of Nigeria. Therefore, the result entails a significant positive relationship between drone technology and the control of the rural banditry menace in the North-Central Region of Nigeria.

Hypothesis 2: There is no significant relationship between Geographic Positioning Systems technology and rural banditry in the North-Central region of Nigeria.

Table 2: Summary of Simple Linear Regressions showing the influence of Geographic Positioning Systems technology on rural banditry in the North-Central Region of Nigeria

Predictor	R	R ²	Df	F	B	T	Sig	Decision
Variable								
Constant	.606	.367	1,175	682.0061	.606	2.212	.027	Significant
Geographic Positioning Systems technology						26.116	.000	

Source: Fieldwork, 2024.

The result presented in Table 2 showed a significant influence of Geographic Positioning Systems technology on rural banditry in the North-Central Region of Nigeria. [(R. 606 = $R^2 = .367$. $F(1, 1, 1755) = 682.066$, $P < .05$)]. This result indicated that Geographic Positioning Systems technology accounted for 36.7% of the technological solutions of rural banditry as observed in the North-Central Region of Nigeria. Therefore, the result entails a significant positive relationship between geographical positioning systems and the control of the rural banditry threat in the north-central region of Nigeria.

Discussion of findings

Drone technology and rural banditry:

The first finding revealed a significant positive relationship between drone technology and the control of rural banditry in Nigeria's North-Central Region. This finding is consistent with Nwokolo and Afolabi's⁴³ finding that drones can be deployed for border surveillance, monitoring illegal crossings, and detecting the movement of contraband goods, arms, and bandits across the borders. This application is essential for preventing the influx of armed groups and the smuggling of weapons that fuel rural banditry.

Probing question: What is your opinion on using drone technology to control rural banditry in your area? A male local farmer (50 years old) said that:

⁴³ Nwokolo, C., and O. Afolabi. *Cross-Border Banditry and Regional Security in West Africa: The Role of UAV Technology*. West African Security Review 16, no. 2 (2017): 49.

Drones could be a game-changer in our fight against bandits. They can monitor large areas and detect suspicious movements before the bandits strike. The challenge, though, is whether the government will implement this technology effectively and ensure it reaches our remote villages.

Probing further, whether you think drones will improve your sense of security.

Yes, if they are used correctly. If the authorities can use drones to track the bandits and respond quickly, it will make us feel safer. However, it must be consistent, not just a one-time effort.

Investigating their thoughts on introducing drone technology to combat rural banditry? A male community leader (61 years old) lamented that:

Drone technology is a welcome development. Our communities have suffered a lot, and any new method to improve security is appreciated. However, the drones must be operated by trained personnel who understand the terrain, and there must be collaboration with local security outfits for it to be effective.

What challenges do you foresee with the use of drones? A female teacher with IDPs Camp Duadu (24 years old) said that:

The biggest challenge will be maintenance and continuous operation. These drones require skilled operators, regular maintenance, and data management systems. If these aspects are not handled well, the whole initiative could fail.

How effective do you think drones can be in controlling rural banditry in the North-Central Region? A security officer, 43 years old, narrated that:

Drones can be highly effective in surveillance and in providing real-time information about bandit movements. They can cover rugged terrains that are hard for ground patrols to access. However, they should be integrated with other security measures, such as ground response teams and communication networks, to make them truly effective.

Are there any limitations to using drones for this purpose? The security officer further alleged that:

There are limitations, particularly regarding battery life, range, and the ability to operate in harsh weather conditions. Also, the success of drones depends on quick response times from ground forces, which can be a challenge in remote areas with limited infrastructure.

What is the government's position on using drones to tackle rural banditry? A government official, a male, 47 years old, said that:

The government is committed to leveraging technology, including drones, to enhance security in rural areas. We have seen the potential of drones in other regions and are working to ensure that they are deployed strategically in the North-Central region. This will involve partnerships with security agencies and training programs for operators.

How soon do you think we will see drones in action? The government official further argued that:

We are in the process of rolling out these technologies. While it may take some time to implement fully due to logistics and training, we are optimistic that drones will start making an impact soon.

How do you feel about using drone technology to protect your community from banditry? A female rural resident, 41 years old, said that:

It is a good idea, but I do not know how it will work in practice. Our community is very remote, and drones might not be able to cover such a large region or be used frequently enough to make a difference.

What would you like to see in the implementation of drone technology? She further claimed that:

I want regular patrols and immediate action when something suspicious is detected.

The community should also be informed about how drones are used and what to do if they spot one. Communication between the authorities and the people is vital.

These responses illustrate a range of perspectives on the use of drone technology to combat rural banditry, highlighting both optimism and concerns about implementation, maintenance, and integration with other security measures.

Geographic Positioning Systems and rural banditry:

The second finding revealed a significant positive relationship between the use of Geographic Positioning Systems and efforts to combat rural banditry in Nigeria's North-Central

Region. This finding is consistent with those of Adamu and Yusuf.⁴⁴, which states that this GPS has significantly reduced cattle rustling incidents and improved the overall security situation in the affected communities. Similarly, in Nasarawa State, GPS technology has been integrated into a broader security framework that includes drone surveillance and community policing. Combining these technologies has resulted in more effective monitoring of rural areas and has facilitated the coordination of security operations.⁴⁵ **Investigate how you perceive the use of GPS in controlling rural banditry in your area. A female local farmer, 48 years old, agreed that:**

I believe GPS technology can be a game-changer for us. The bandits often take advantage of the vast and challenging terrain, making it hard for security forces to track them. If we had GPS systems that monitored movements and alerted the authorities before they struck, it would be easier. It could also help us farmers feel safer when going to our farms, knowing there is a way to track our location if something goes wrong.”

What are your thoughts on the effectiveness of GPS in combating rural banditry? A female security personnel, 33 years old, said that:

GPS technology is crucial in modern security operations. It can help us map out vulnerable areas and track suspicious activities. However, the challenge lies in implementation. Many rural areas need more infrastructure to support such

⁴⁴ B. Adamu and M. Yusuf. “Community-Based GPS Tracking as a Tool for Rural Security in Benue State”. *Journal of Rural Security Studies* 12, no. 1 (2023): 78.

⁴⁵ J. Audu. “Integrating GPS Technology with Drone Surveillance for Enhanced Security in Nasarawa State”. *International Journal of Security Technology* 18, no. 3 (2023): 200.

technology, and the cost of equipping and training personnel can be high. However, if these issues are addressed, GPS could significantly reduce the incidence of banditry.

How is the local government planning to implement GPS technology to combat rural banditry? A local government official staying in IDP Camp Daudu, 28 years old, postulated that:

We are currently planning to integrate GPS technology into our security strategy. The idea is to create a network of GPS-enabled devices that local vigilante groups and security forces can use to monitor hotspots. We are also exploring partnerships with tech companies to make this a reality. However, budgetary constraints exist, and we need to ensure that the community is trained and aware of how to use this technology effectively.

How would you describe the community's reception towards using GPS for security purposes? A male community leader, 62 years old, said that:

There is a general sense of optimism, but also some scepticism. People are hopeful that GPS can help reduce banditry, but there are privacy concerns about whether this technology can be effective in such a large, rugged area. We need to do a lot of sensitization to get people on board and explain how it works and how it can protect them.

Do you think GPS can help secure trade routes from bandit attacks? Rural trader, 41 years old, said that:

It can make a big difference. Bandits often target traders because they know our routes and when we are most vulnerable. If we had GPS systems that monitored our movements and shared our locations with security forces, it would deter many of these attacks. However, it is also vital that this technology is affordable and accessible to everyone who needs it.

From an academic perspective, what is your view on the use of GPS in addressing rural banditry? An academic researcher at Benue State University, Makurdi, said that:

The use of GPS holds excellent potential for proactive security measures. It can provide real-time data that helps prevent attacks and respond swiftly when they occur. However, extensive research is needed to understand the specific challenges of implementing GPS in rural areas, such as signal coverage and integration with existing security frameworks. The success of such a system depends on carefully addressing these factors.

Conclusion

The influx of nomads into North-Central Nigeria has significantly contributed to the escalating challenge of rural banditry, disrupting socio-economic stability and agricultural productivity. The complex dynamics of this crisis, rooted in competition for resources, cultural differences, and the absence of effective governance, require innovative approaches to resolution. Technological solutions such as drone technology and Geographic Positioning Systems (GPS) offer promising avenues to address this challenge. Drones provide real-time surveillance and early warning systems that can pre-emptively identify and deter bandit activities. GPS technology enhances the precision of movement tracking, facilitating rapid responses by security agencies and

enabling better resource allocation to protect vulnerable rural areas. Integrating these technologies into rural security strategies can potentially transform the landscape of rural banditry management. However, their effectiveness hinges on proper implementation, sustained governmental support, and the capacity building of local security forces. Furthermore, these technologies must be complemented by community engagement and trust-building measures to ensure that their deployment does not exacerbate existing tensions or create new conflicts.

Recommendations

Based on the findings, the study recommended that:

The government and relevant security agencies should prioritize deploying drone technology in rural areas prone to banditry. These drones should have high-resolution cameras and night vision capabilities to ensure round-the-clock surveillance. Establishing centralized command centres to monitor drone feeds in real-time will enable rapid response to emerging threats.

A comprehensive GPS tracking system should be implemented to monitor the movement of nomadic groups and potential bandit activity. This system should be linked to local law enforcement agencies, enabling quick identification and interception of suspicious activity. Moreover, the use of GPS should be extended to protect farmlands and livestock by tracking herders' movements and identifying unauthorized encroachments.

Training programs should be established to enhance the technical skills of local security personnel in operating drones and GPS technologies. This includes operating these systems, interpreting data, and coordinating responses based on real-time intelligence.

To ensure the success of these technological interventions, it is crucial to involve local communities in the planning and execution phases. Establishing community liaison officers who

can bridge the gap between technology operators and local populations will foster trust and cooperation, ensuring these technologies are seen as tools for protection rather than surveillance.

The successful implementation of drone and GPS technologies requires sustained financial and logistical support from the government. This includes the initial investment in equipment and ongoing maintenance, upgrades, and training. Policies should be enacted to ensure that these technologies are deployed and maintained over the long term.

The government should develop clear policies and legal frameworks governing the use of drones and GPS technologies in rural areas. These frameworks should address issues such as privacy, data security, and human rights protection, ensuring that technological solutions do not infringe on the rights of local populations.

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