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FARMERS-HERDERS CONFLICT IN KOGI CENTRAL SENATORIAL DISTRICT, NIGERIA: TEMPORAL TRENDS, SPATIAL CONCENTRATION AND THE EFFICACY OF COMMUNITY POLICING INITIATIVES, 2011 TO 2023

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Abstract

This study examined the spatial and temporal patterns of farmers-herders conflict, recorded in police returns under the offence category of mischief by cow and arson, in Kogi Central Senatorial District, Nigeria, between 2011 and 2023. The work was motivated by the absence of geo-referenced, substate analysis of officially recorded conflict data for the district, without which security intervention cannot be targeted with any precision. An explanatory mixed methods design was adopted. Secondary data comprising 293 police recorded incidents drawn from eight divisional crime registers were analysed using descriptive statistics and Inverse Distance Weighting interpolation in ArcGIS 10.8 to delineate hotspots. Primary data were obtained through a crime victimisation survey of 109 respondents, five Focus Group Discussions involving 38 participants, and ten Key Informant Interviews with police officers, farmers, herders, political leaders, community association executives, youth leaders and traditional rulers. Findings revealed pronounced temporal variation, with peaks in 2016 and 2017 that together accounted for 24.2 percent of all incidents, and a trough in 2020 that coincided with pandemic movement restrictions. Spatially, incidents clustered along the Adogo-Ajaokuta and Itakpe-Okehi axes, which together carried 58.8 percent of the series, while two of the five Local Government Areas accounted for 75.1 percent. The concentration follows transhumance corridors, forest margins and water points rather than settlement size. Seasonally, 68 percent of incidents fell between November and February, the dry season window in which southward pastoral movement coincides with the standing harvest. Community policing structures were widely known but weakly effective: 76.15 percent of respondents were aware of a peace committee or vigilante group, yet only 29.36 percent judged these structures effective, an implementation gap of 46.79 percentage points attributed principally to absent logistics and contested impartiality. The study concludes that climatic variability sets the timing and direction of pastoral movement while governance deficits determine whether that movement ends in accommodation or in violence. It recommends dry season hotspot deployment calibrated to seasonal forecasts, cartographic demarcation and gazetting of transhumance corridors away from cropland, provision of water and fodder reserves, institutionalised joint farmer and herder peace forums, and state legislation to clarify the mandate and resourcing of community policing structures.

Keywords: farmers-herders conflict; mischief by cow; spatial pattern; temporal pattern; hotspot analysis; community policing; Kogi Central

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1. Introduction

1.1 Background to the Study

Conflict between crop farmers and pastoralists is among the most persistent and lethal forms of resource competition in Nigeria and the wider Sahel (Olaniyan, Francis and Okeke, 2018). In the crime returns of the Nigeria Police Force the phenomenon is recorded under the administrative heading of mischief by cow and arson, a category that captures the destruction of standing crops by cattle together with the reprisal burning of farmland, dwellings and fodder that frequently follows. The label is bureaucratic rather than analytical, yet it has an important property: it is recorded consistently across divisions and across years, which makes it one of the few instruments available for tracing the phenomenon over an extended period at a scale finer than the state.

The conflict is commonly narrated as a contest over land and water driven by a drying climate. That account is not wrong, but it is incomplete. Environmental pressure determines when and where pastoralists move; it does not determine whether that movement is absorbed peacefully or escalates into violence. The latter depends on the institutions governing access to land, the presence or absence of enforceable rules about corridors and grazing reserves, and the capacity of local security structures to arbitrate before damage becomes reprisal (Abbass, 2014; Brottem, 2016). Treating climate as a sufficient explanation obscures exactly the variables that policy can act upon.

Kogi Central Senatorial District, in the Guinea Savannah of north central Nigeria, has recorded a growing incidence of such conflict between 2011 and 2023. The district occupies a transitional position in the national pastoral system. It lies on the southward route linking the dry season corridors of the north to the livestock markets of the south, and it carries extensive forest margins, mining concessions and irrigated valley bottoms. Each of these features draws cattle and cultivators into the same space at the same time of year.

Despite a substantial Nigerian literature on farmers-herders conflict (Odoh and Chilaka, 2012; Ofuoku and Isife, 2009; Ezeomah, 2021), relatively little work has examined the spatial clustering and temporal structure of police recorded incidents at the substate scale, and almost none has paired that analysis with an assessment of whether community policing structures actually function. The present study addresses both omissions for Kogi Central over a thirteen year window.

1.2 Statement of the Problem

Security planning in the district proceeds largely without geography. Deployment decisions are made at divisional level on the basis of recent complaint volume rather than on any mapped understanding of where incidents concentrate or when they are expected. The consequence is predictable: resources arrive after the event, in the places that reported last rather than the places most likely to report next. Meanwhile community policing structures have proliferated without legal mandate, budget or clear jurisdiction, so that their existence is widely known but their utility is contested.

What is missing is an empirical description of the phenomenon precise enough to support anticipatory action: where incidents cluster, how the series has moved over time, when within the year risk is concentrated, and whether the local structures nominally charged with prevention are perceived to work. This study supplies that description.

1.3 Aim and Objectives

The aim of the study was to examine the spatial and temporal patterns of farmers-herders conflict in Kogi Central Senatorial District between 2011 and 2023. The specific objectives were to:

(i) examine the temporal trend of farmers-herders conflict incidents in Kogi Central between 2011 and 2023;

(j) analyse the spatial distribution and concentration of incidents across the Local Government Areas of the district;

(k) assess the seasonal pattern of incident occurrence; and

(l) assess the role, awareness and perceived effectiveness of community policing structures in managing the conflict.

1.4 Significance of the Study

For security agencies the identification of spatial hotspots and seasonal peaks converts a reactive posture into an anticipatory one, since both the location and the timing of elevated risk become forecastable. For land administration the mapping of incident clusters against transhumance corridors provides the evidential basis for demarcation and gazetting, which is the single intervention most frequently recommended and least frequently grounded in data. For scholarship the study contributes a thirteen year, geo-referenced series from official records at a scale at which Nigerian conflict data are rarely assembled.

2. Literature Review

2.1 Conceptual Clarification

Farmers-herders conflict denotes resource competition between crop cultivators and pastoralists over land, water and crop residues. In the Nigerian context it typically manifests as crop destruction by cattle, cattle rustling, arson, assault and homicide

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(Abbass, 2014; Olaniyan, 2015).

Community policing denotes a strategy of partnership between the police and local populations for the prevention of crime and conflict. In rural Nigeria it is operationalised largely through vigilante groups, local hunters and ad hoc peace committees rather than through the formal structures envisaged in police doctrine (Baker, 2008).

Mischief by cow and arson is the police classification under which the phenomenon enters the official record. Its use in this study is deliberate: it is the unit in which the state actually counts, and analysis conducted in that unit can be fed back directly into police planning.

2.2 Theoretical Framework

The study draws on three complementary theories.

Environmental Scarcity Theory (Homer-Dixon, 1999) holds that population growth and resource degradation generate scarcity that can precipitate migration and violent competition. Applied here, the theory predicts that deteriorating northern pasture advances the timing of southward movement and lengthens the period of overlap between cattle and standing crops.

Crime Pattern Theory (Brantingham and Brantingham, 1995) holds that offending is not randomly distributed but concentrates at nodes, along paths and at edges where routine activities converge. For this offence the paths are transhumance corridors, the nodes are markets and water points, and the edges are the margins between forest and cultivated land.

Social Disorganization Theory (Sampson and Groves, 1989) holds that communities with weak institutions and low collective efficacy are less able to resolve disputes before they escalate. The theory supplies the expectation against which the awareness and effectiveness of community policing structures are assessed.

2.3 Empirical Review

Internationally, the evidence linking climatic variability to communal conflict in resource dependent societies is substantial though contested. Burke et al. (2009) reported a measurable association between temperature anomalies and civil conflict in Africa, while Scheffran et al. (2012) argued that climate acts through intervening social and institutional pathways rather than directly. Brottem (2016) demonstrated for northern Mali that pastoral conflict intensity tracks the political ecology of land access more closely than it tracks rainfall alone.

Within Nigeria, Odoh and Chilaka (2012) examined the theoretical and empirical links between climate change and farmer and herder conflict, and Ofuoku and Isife (2009) documented causes, effects and resolution mechanisms in Delta State. Olaniyan (2015) analysed the political economy of cattle rustling, and Olaniyan, Francis and Okeke (2018) traced the militarisation of the conflict. Ezeomah (2021) linked conflict incidence to rural development outcomes in Kogi State specifically. On the criminological side, Weisburd (2015) formulated the law of crime concentration, and Weisburd and Telep (2014) reviewed the evidence on hotspot policing, both of which inform the analytical strategy adopted here.

2.4 Gap in the Literature

No previous study has mapped thirteen years of police recorded farmers-herders conflict data for Kogi Central, nor tested the perceived effectiveness of community policing in that setting. This study addresses both gaps by integrating divisional crime registers with primary survey and interview material. A companion analysis by the present authors examined kidnapping and armed robbery in the same district using the same victimisation survey (Shaib et al., 2026); the present paper is confined to the mischief by cow and arson series and to the community policing items, which that paper did not analyse.

3. Methodology

3.1 Study Area

Kogi Central Senatorial District lies between latitudes 7°15′ N and 7°46′ N and longitudes 6°11′ E and 6°55′ E. It is bounded by Kogi East to the east, Kogi West to the west, Edo State to the south and Lokoja Local Government Area to the north. The district covers approximately 3,172.5 km^2, about 10.9 percent of the 29,833 km^2 land area of Kogi State, and comprises five Local Government Areas: Okene, Adavi, Okehi, Ogori-Magongo and Ajaokuta. The vegetation is Guinea Savannah, with a wet season running from April to October and a dry season from November to March. This seasonal rhythm is central to the analysis that follows, because it governs both the agricultural calendar and the timing of pastoral movement.

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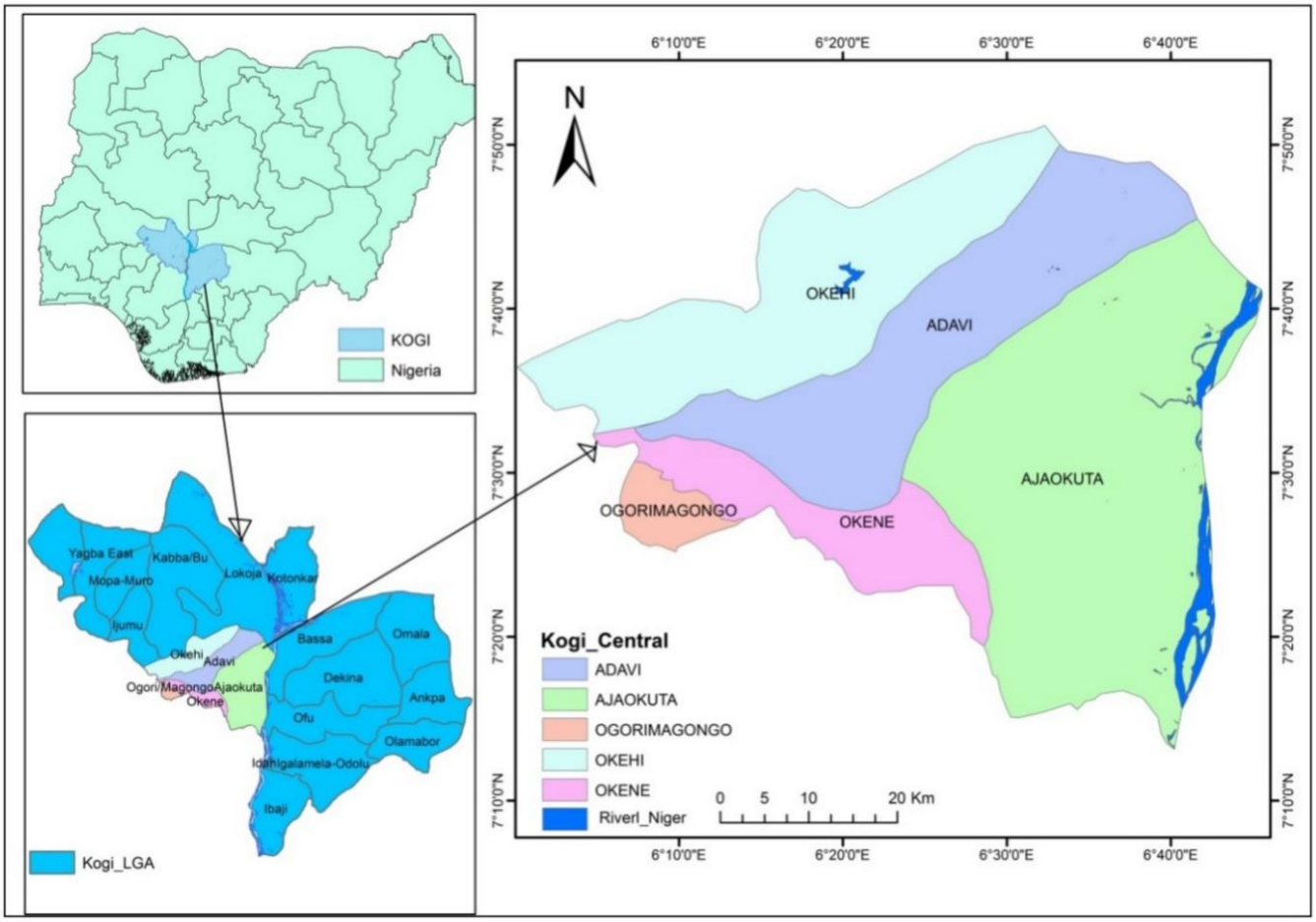


Figure 1: Location of Kogi Central Senatorial District within Kogi State and Nigeria, showing the five constituent Local Government Areas of Adavi, Ajaokuta, Ogori-Magongo, Okehi and Okene, together with the course of the River Niger along the eastern boundary. Source: Department of Geography, Federal University Lokoja (2024).

3.2 Research Design

An explanatory mixed methods design was adopted (Creswell and Plano Clark, 2018). Quantitative data establish the pattern; qualitative data explain the mechanism. The sequence matters for interpretation: the statistical description is treated as the phenomenon to be explained, and the interview material as the explanation, rather than the two being presented as independent findings.

3.3 Types and Sources of Data

Primary data. One hundred and nine questionnaires were administered to farmers, herders and other critical stakeholders. Five Focus Group Discussions were conducted with farmers, youths, community association leaders, landowners and herders, involving 38 participants in total. Ten Key Informant Interviews were held with police officers, traditional rulers, vigilante leaders and local government officials.

Secondary data. Crime registers were obtained from the eight divisional police stations serving the district, covering the years 2011 to 2023 for the offence category of mischief by cow and arson. The divisions are Okene, Ogaminana, Obangede, Adogo, Asco, Itakpe, Ganaja and Akpafa. The resulting series comprises 293 recorded incidents.

3.4 Sampling Technique

A multistage sampling procedure was used. At the first stage two conflict prone communities were purposively selected within each Local Government Area, on the advice of divisional police officers and local administrators. At the second stage respondents were drawn systematically from among critical stakeholders within those communities.

3.5 Methods of Data Analysis

Quantitative data were analysed in SPSS version 27 for frequencies, ratios and cross tabulations, with the chi square statistic used to test whether incidents were evenly distributed across Local Government Areas. Temporal structure was examined through descriptive statistics and graphical trend analysis (Field, 2018). Spatial pattern was examined in ArcGIS 10.8 using Inverse Distance Weighting interpolation of georeferenced incident locations to delineate hotspots, following the approach reviewed by Weisburd and Telep (2014). Qualitative material was transcribed and coded thematically in NVivo 14.

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Inverse Distance Weighting estimates the value of an unsampled location as a weighted average of surrounding observations, with weights declining as a power of distance. For a location s_0 the interpolated incident intensity is

$$Z(s_0) = \sum_{i=1}^{n} \lambda_i Z(s_i), \quad \text{where } \lambda_i = d_i^{-p} / \sum_{j=1}^{n} d_j^{-p} \quad (1)$$

in which $Z(s_i)$ is the observed count at sampled location s_i, d_i is the distance from that location to s_0, n is the number of neighbouring observations entering the calculation, and p is the power parameter governing the rate of distance decay. A power of two was used, which is the standard setting for crime surface interpolation and weights proximate observations heavily without producing the discontinuities associated with higher powers.

The evenness of the spatial distribution was tested with the chi square statistic

$$\chi^2 = \sum_{i=1}^{k} (O_i - E_i)^2 / E_i \quad (2)$$

where O_i and E_i are the observed and expected counts for Local Government Area i and k is the number of areas, giving $k - 1$ degrees of freedom under the null hypothesis of an even distribution.

4. Results

4.1 Spatial Pattern of Farmers-Herders Conflict, 2011 to 2023

Table 1 presents the distribution of the 293 recorded incidents across the eight police divisions serving the district. The distribution is markedly uneven. The Adogo-Ajaokuta and Itakpe-Okehi axes together carried 58.8 percent of the series, and when divisions are aggregated to Local Government Area the two leading areas, Ajaokuta and Okehi, accounted for 75.1 percent. The chi square test confirms that this departure from an even distribution is not attributable to chance, $\chi^2(4, N = 293) = 19.42$, $p < .001$.

Table 1: Distribution of reported farmers-herders conflict incidents by police division, 2011 to 2023

Police division	Local Government Area	Incidents	Share (%)	Principal hotspot setting
Adogo	Ajaokuta	113	38.57	Forests and grazing routes
Itakpe	Okehi	59	20.14	Forest, water points and routes
Asco	Ajaokuta	46	15.70	Industrial farmland
Okene	Okene	38	12.97	Central market area
Ogaminana	Adavi	24	8.19	Highway and transhumance corridor
Obangede	Adavi	10	3.41	Forests, hills and grazing routes
Ganaja	Ajaokuta	2	0.68	New urban fringes
Akpafa	Ogori-Magongo	1	0.34	Rural borders
Total		**293**	**100.00**	

Note. N = 293 incidents. Percentages are computed on the full series and have been recalculated from the raw counts. Source: Kogi State Police Command divisional registers, 2011 to 2023.

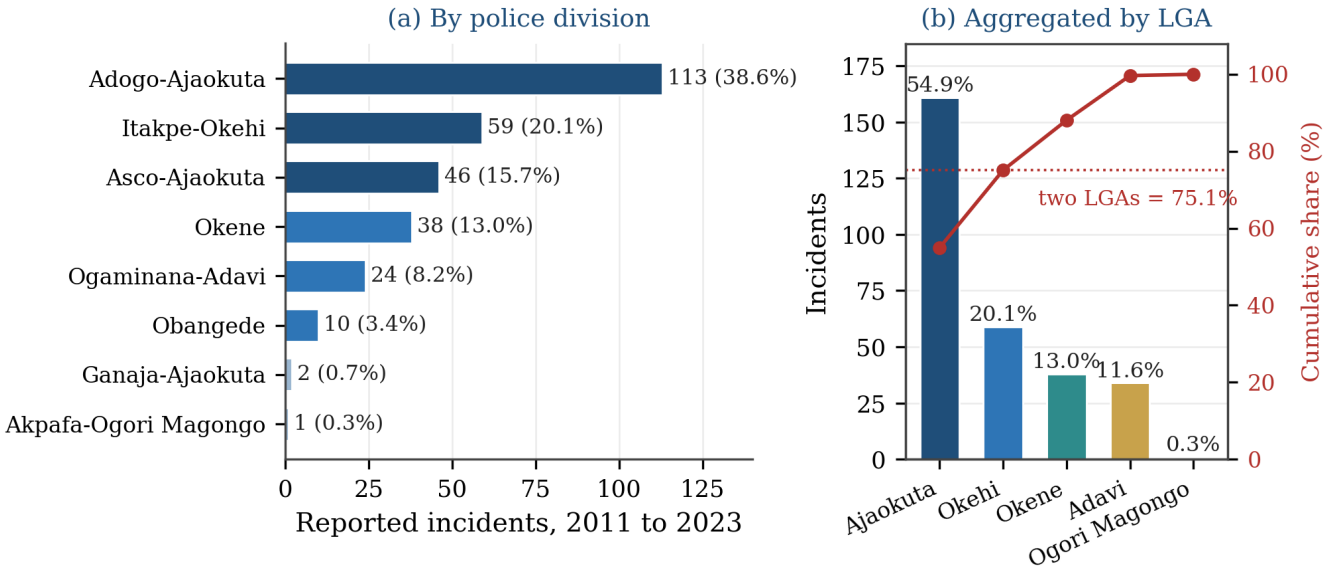


Figure 2: Spatial distribution of recorded incidents. Panel (a) ranks the eight police divisions by incident count. Panel (b) aggregates divisions to Local Government Area and plots the cumulative share, showing that two of the five areas carry just over three quarters of the thirteen year series.

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4.1.1 Hotspot Delineation

Inverse Distance Weighting interpolation of the georeferenced incident locations produced the surface shown in Figure 3. The highest intensity falls on Adogo in Ajaokuta Local Government Area, with a secondary concentration around Itakpe in Okehi and a tertiary cluster at Okene. The interpolated surface follows the transhumance path running from the north towards Okene market, and thickens where that path meets forest margins in Adogo and stream courses in Itakpe. The pattern is consistent with Crime Pattern Theory: incidents concentrate along paths and at edges rather than being distributed in proportion to population (Brantingham and Brantingham, 1995). The finding extends earlier local observation identifying Okene central market as an early focus of friction, by showing that the centre of gravity has since shifted eastward towards Ajaokuta.

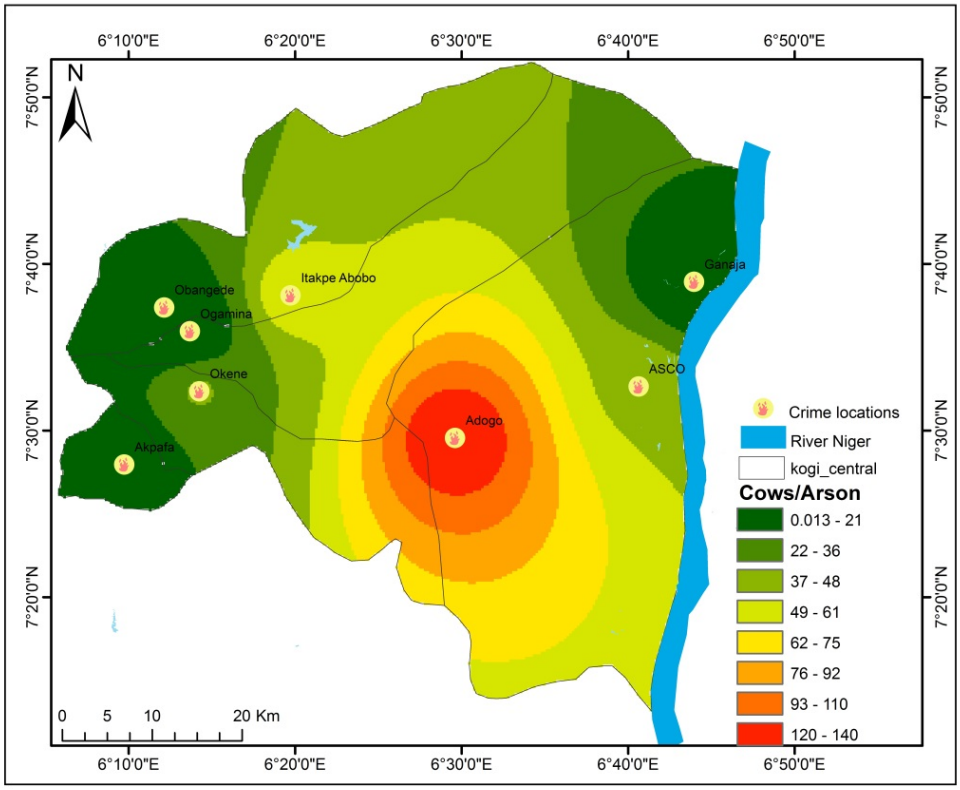


Figure 3: Interpolated intensity surface for farmers-herders conflict in Kogi Central, 2011 to 2023, produced by Inverse Distance Weighting of georeferenced divisional records. Darker red denotes higher incident density per unit area. Point symbols mark the eight reporting divisions. Source: authors' analysis of police records and field survey, 2024.

4.2 Temporal Trend

Table 2 and Figure 4 set out the annual series. Incidents were not evenly distributed across the thirteen years. Two peaks occurred in 2016 and 2017, with 36 and 35 incidents respectively, which together represent 24.2 percent of the entire series within a two year window. The lowest count was 9 incidents in 2020. The series declined from 2013 to 2015, rose sharply in 2016, fell through 2018 and 2019, collapsed in 2020 and has risen again from 2021 onwards. The thirteen year mean is 22.5 incidents per annum.

Table 2: Temporal trend of reported farmers-herders conflict, 2011 to 2023

Year	Incidents	Change on previous year (%)	Share of series (%)
2011	22	–	7.51
2012	32	+45.5	10.92
2013	21	–34.4	7.17
2014	15	–28.6	5.12
2015	14	–6.7	4.78
2016	36	+157.1	12.29
2017	35	–2.8	11.95

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Year	Incidents	Change on previous year (%)	Share of series (%)
2018	24	−31.4	8.19
2019	20	−16.7	6.83
2020	9	−55.0	3.07
2021	12	+33.3	4.10
2022	25	+108.3	8.53
2023	28	+12.0	9.56
Total	**293**		**100.00**

Note. Source: Nigeria Police Force, Kogi State Command, divisional registers, 2011 to 2023. Share of series computed by the authors.

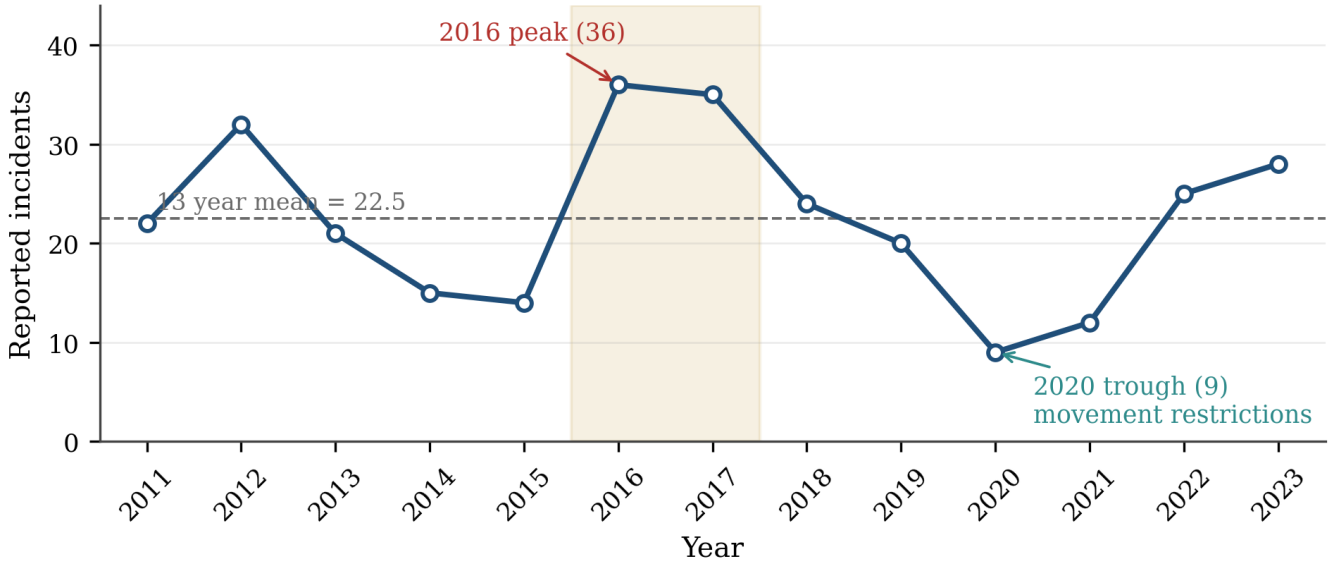


Figure 4: Annual trend of recorded farmers-herders conflict incidents, 2011 to 2023. The shaded band marks the 2016 and 2017 peak, which carries 24.2 percent of the series. The broken horizontal line is the thirteen year mean of 22.5 incidents.

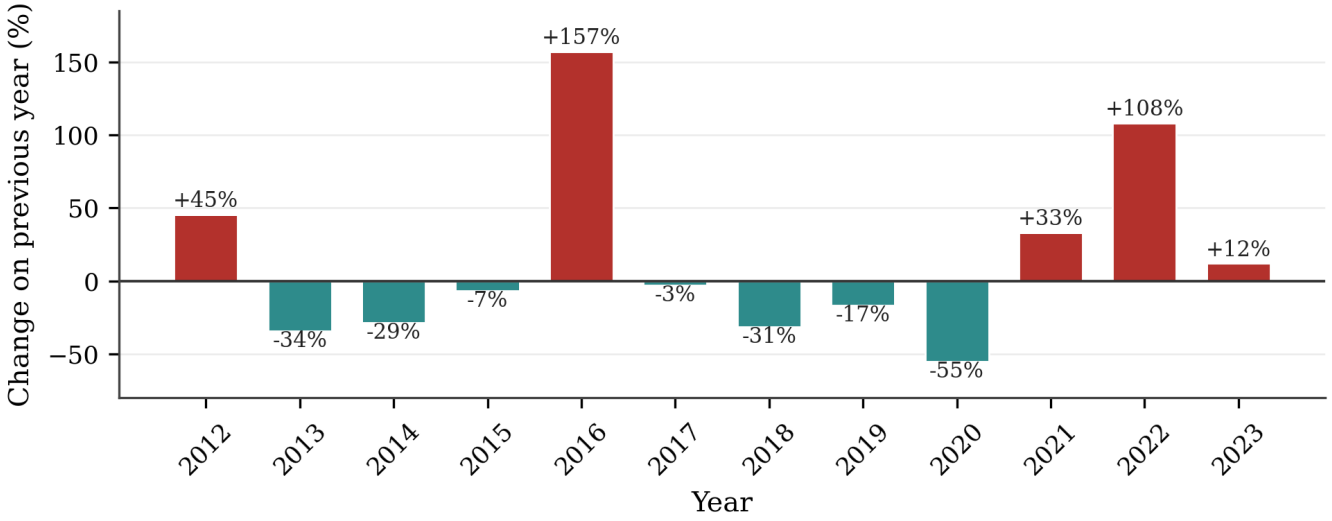


Figure 5: Year on year percentage change in recorded incidents. The volatility of the series is evident: six of the twelve transitions exceed thirty percent in absolute terms, which indicates that the underlying process is episodic rather than smoothly trending.

4.3 Seasonal Pattern and Explanatory Insight

Evidence from the Focus Group Discussions and Key Informant Interviews indicates that 68 percent of incidents fall between November and February (Figure 6). This window corresponds to the dry season, when northern pasture fails and herds move southward, and simultaneously to the period when harvested and standing crops are most exposed. The convergence is not coincidental but structural: the agricultural and pastoral calendars place the two livelihoods in the same space at the same moment.

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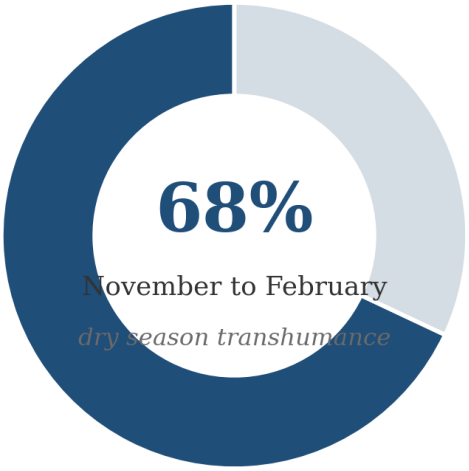


Figure 6: Seasonal concentration of incidents. Sixty eight percent of reported conflict falls within the four month dry season window from November to February, when southward transhumance coincides with the standing and harvested crop.

A Divisional Police Officer described the pattern in operational terms:

"Most cases are reported between November and February. That is when herders come down from the North. The farms are ready for harvest and the cattle destroy them." (Key Informant Interview, Divisional Police Officer, Adavi Division, March 2024)

A herder participating in a Focus Group Discussion explained the logic of movement from the pastoral side, and in doing so identified the mechanism by which climatic variability shifts the timing of risk:

"When there is no grass in Sokoto, we must move early. If we wait, our cattle will die. So we sometimes enter Kogi in October instead of December." (Focus Group Discussion, herder, Okehi, March 2024)

The second account is analytically significant. It indicates that pastoral departure is governed by forage failure rather than by the calendar, so that in dry years the arrival of herds advances into October, when a greater proportion of the crop is still standing. Climatic variability therefore acts on conflict risk not by changing the total volume of movement but by changing its timing relative to the harvest, and thereby the quantity of crop at risk when herds arrive.

4.4 Awareness and Effectiveness of Community Policing

Table 3 presents survey responses on community policing structures. The results reveal a wide gap between knowledge and confidence. While 76.15 percent of respondents were aware of a peace committee or vigilante group in their locality, and 55.96 percent had reported a conflict to such a structure, only 29.36 percent regarded these structures as effective in resolving disputes. The implementation gap, measured as the difference between awareness and perceived effectiveness, is 46.79 percentage points. The most frequently cited obstacle was the absence of logistics, named by 43.12 percent of respondents.

Table 3: Awareness and perceived effectiveness of community policing in conflict management

Variable	Response category	Frequency	Percent (%)
Awareness of peace committee or vigilante group	Yes	83	76.15
Reported conflict to a community structure	Yes	61	55.96
Perceived effectiveness in resolution	Effective	32	29.36
Major challenge identified	Lack of logistics	47	43.12

Note. N = 109 respondents. Source: crime victimisation survey, 2024.

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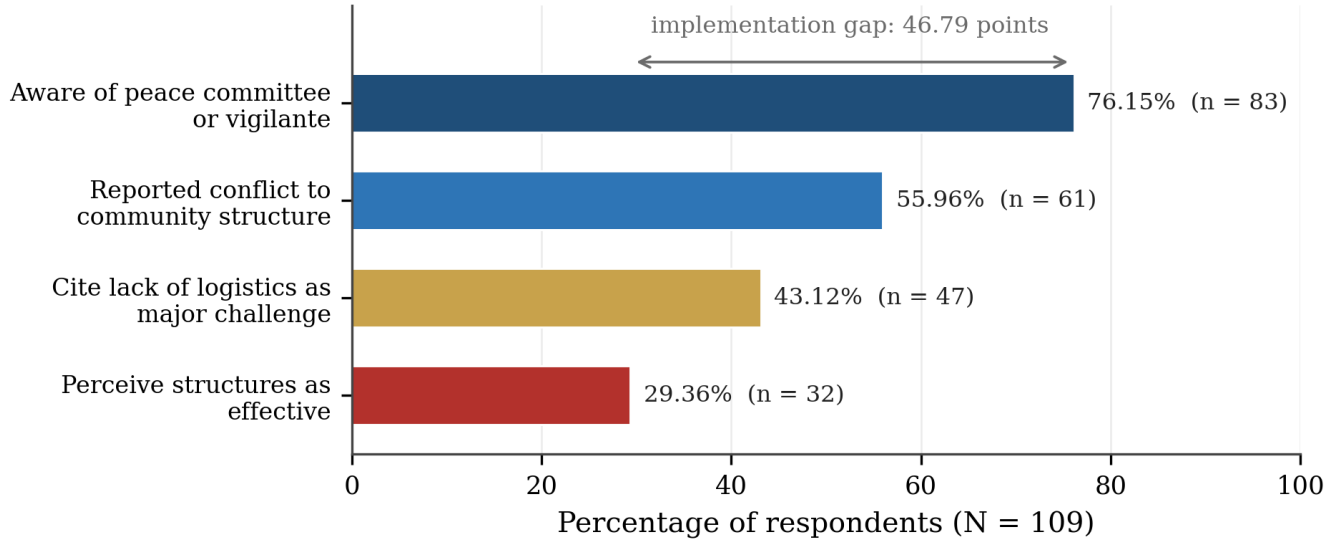


Figure 7: Awareness and perceived effectiveness of community policing structures. The spread between awareness and perceived effectiveness, 46.79 percentage points, is the operative finding: these structures are known to almost everyone and trusted by fewer than one respondent in three.

Qualitative material locates the source of the gap in two distinct problems: contested impartiality and absent resources. A vigilante leader articulated both:

"We try to settle cases, but farmers say we favour herders, and herders say we collect money from farmers. We also have no vehicle to chase cattle into the bush." (Key Informant Interview, vigilante leader, Okehi, March 2024)

A police officer identified the same resource constraint within the formal service:

"We do not have enough men to patrol the grazing routes. By the time we arrive, the cattle are gone." (Key Informant Interview, police officer, Okene, March 2024)

4.5 Drivers and Consequences

Survey respondents identified climate induced migration as the leading driver of conflict at 38.5 percent, followed by land scarcity at 27.5 percent and weak law enforcement at 18.3 percent. The reported consequences were dominated by loss of crops at 71.6 percent, with displacement reported by 34.9 percent and injury or death by 12.8 percent (Figure 8). The distribution of consequences is informative: the modal outcome is economic rather than physical, which indicates that the conflict imposes its heaviest burden through the destruction of livelihoods rather than through direct violence, even though the latter attracts the greater share of public attention.

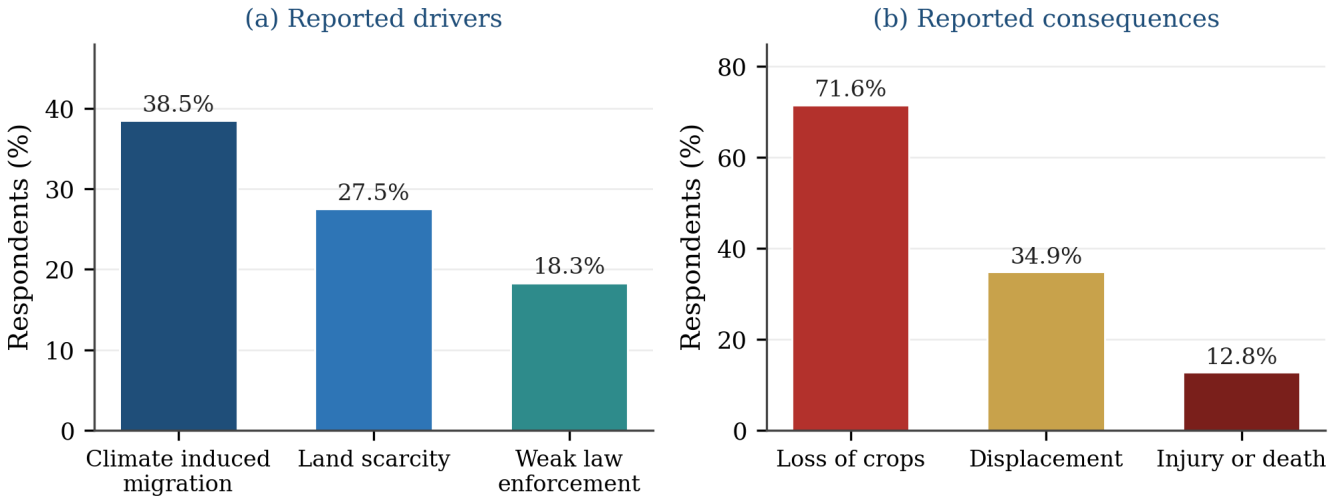


Figure 8: Reported drivers and consequences of farmers-herders conflict. Panel (a) shows the drivers identified by survey respondents; panel (b) the consequences reported. Percentages are of respondents and do not sum to one hundred because multiple responses were permitted.

5. Discussion

5.1 The Geography of Concentration

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The spatial findings reproduce, at district scale, one of the most robust regularities in criminology. Weisburd (2015) formulated the law of crime concentration as the proposition that a small proportion of places accounts for a large proportion of events, across offence types and across jurisdictions. The present series conforms: two of five Local Government Areas carry 75.1 percent of incidents, and two of eight police divisions carry 58.8 percent. That this holds for a rural resource conflict, rather than for the urban property crime on which the law was established, is itself a contribution, since it suggests the underlying mechanism is the convergence of routine activities in space rather than anything specific to urban form.

The substance of that convergence is legible in the interpolated surface. Intensity is highest where transhumance corridors intersect forest margins and water courses, not where population is densest. Okene, the largest settlement, ranks fourth. Adogo, a smaller place but one situated on the corridor and adjacent to extensive forest, ranks first with nearly four times the Okene count. In the vocabulary of Crime Pattern Theory the corridors are paths along which herds move, the water points and markets are nodes at which they halt, and the forest and farm boundary is the edge at which crop damage occurs (Brantingham and Brantingham, 1995). Conflict is produced at the intersection of these three, which is why it can be mapped and therefore anticipated.

This has a direct operational implication. Because the geography is stable over thirteen years and tied to physical features that do not move, it is forecastable in a way that most crime distributions are not. A corridor does not shift between seasons. Hotspot policing, whose evidence base Weisburd and Telep (2014) reviewed, is accordingly better suited to this offence than to many of the offences for which it is conventionally deployed, provided that deployment is calibrated to the seasonal window identified in Section 4.3.

5.2 Temporal Structure and the Limits of a Climatic Account

The annual series is episodic rather than trending. The 2016 and 2017 peak coincides with the nationwide escalation in farmer and herder violence documented across the Middle Belt during that period, and with the Nigerian economic recession, which compressed rural incomes and reduced the capacity of households to absorb crop losses without recourse to reprisal. The 2020 trough is readily explained by pandemic movement restrictions, which suppressed both transhumance and the reporting of incidents; it should be read as a suppression of recorded conflict rather than necessarily of conflict itself. The resurgence from 2021, reaching 28 incidents by 2023, indicates that the underlying drivers were interrupted rather than resolved.

It is here that the data impose a useful discipline on the climatic narrative. If climatic variability were the proximate cause of conflict volume, the annual series would track rainfall and temperature anomalies. It does not do so in any simple fashion: the sharpest single movement in the series, the 157 percent rise into 2016, aligns with a macroeconomic shock and a national escalation rather than with a meteorological one, and the deepest trough aligns with an administrative restriction on movement. What the qualitative evidence shows instead is that climate operates on *timing*. The herder quoted in Section 4.3 does not say that drought produces conflict; he says that forage failure makes him move in October rather than December. Climate thus determines when herds arrive relative to the harvest, and so how much crop stands exposed when they do, while the volume of resulting conflict depends on whether institutions exist to arbitrate the resulting damage.

This reading is consistent with the broader literature. Burke et al. (2009) reported an association between temperature and conflict in Africa, but Scheffran et al. (2012) argued that the association is mediated by social and institutional pathways rather than operating directly, and Brottem (2016) showed for the Malian case that conflict intensity tracks the politics of land access more closely than rainfall. The present findings support the mediated account. The implication for policy is substantial, because mediated causation means that the climatic signal can be absorbed by institutional reform even where the climate itself cannot be altered.

5.3 Why Community Policing Is Known but Not Trusted

The most policy relevant finding of the study is the 46.79 point gap between awareness of community policing structures and belief in their effectiveness. The gap is not a knowledge problem. Three quarters of respondents know the structures exist and more than half have used them. It is a capability and legitimacy problem, and the qualitative material separates the two components cleanly.

The capability component is resource failure. The vigilante leader has no vehicle; the police officer has insufficient personnel to patrol corridors. Both describe an identical operational reality in which the response arrives after the herd has moved on, which converts enforcement into after the fact documentation. The legitimacy component is distributional. The vigilante leader reports that farmers believe he favours herders while herders believe he is paid by farmers, which is the signature of an arbitrator with no mandate: lacking authority derived from law, such a body derives it from the parties themselves, and is therefore suspected by whichever party loses.

Social Disorganization Theory anticipates precisely this outcome. Sampson and Groves (1989) argued that collective efficacy depends not on the presence of local associations but on their capacity to act and on shared expectations about their impartiality. Kogi Central has the associations in abundance and neither of the other two conditions. Baker (2008) made the related observation that multi-choice policing arrangements across Africa commonly lack state backing, leaving them visible but unenforceable. The present data quantify that general observation for one district, and the figure of 29.36 percent perceived

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effectiveness supplies a baseline against which any subsequent reform could be measured.

The policy inference follows directly and is unusually specific. Awareness campaigns would address a deficit that does not exist. What the structures lack is statutory mandate, defined jurisdiction, and the material means of response. Legislation clarifying the role of community structures, coupled with a modest logistics allocation, would address both components simultaneously, since legal mandate supplies the impartiality that voluntary arbitration cannot and transport supplies the capacity that voluntary effort cannot fund.

5.4 Economic Burden and the Case for Anticipatory Deployment

The consequence profile deserves emphasis because it is frequently inverted in public discussion. Loss of crops was reported by 71.6 percent of respondents, displacement by 34.9 percent and injury or death by 12.8 percent. Fatal violence is thus the least common outcome and crop loss by a wide margin the most common. The conflict is experienced by most of those affected as an economic event, and its principal social cost is the erosion of agricultural livelihoods in a district where those livelihoods are already marginal. Abbass (2014) characterised the Nigerian pattern as a struggle for survival between two production systems rather than as communal hostility, and the distribution reported here supports that characterisation.

Reading the three findings together produces a coherent intervention logic. The geography is stable and mapped; the timing is concentrated in a four month window; the institutions nominally responsible are known but incapable. Deployment that is spatially targeted on the corridors identified in Figure 3, temporally concentrated in the November to February window identified in Figure 6, and operationally supported by community structures with legal mandate and transport, addresses all three simultaneously. Each element is weak alone: mapping without seasonal timing disperses effort across the year, seasonal timing without mapping disperses it across space, and both without institutional capacity produce arrival after the event. The practical value of the present analysis lies in showing that the three can be specified jointly from available data.

5.5 Limitations

Several limitations qualify these findings. The series rests on police records and therefore measures reported rather than actual incidents; underreporting is likely to be greatest in the remoter divisions, which would understate the dispersion of the true distribution. The 2020 trough almost certainly reflects reporting suppression as well as genuine reduction. The seasonal estimate of 68 percent derives from interview testimony rather than from dated case records, and should be regarded as an informed approximation pending extraction of incident dates from divisional registers. The study did not obtain station level rainfall and temperature series, so the relationship between climatic variability and incident timing is argued from qualitative testimony rather than tested statistically. Finally, the survey sample of 109 respondents, while adequate for the descriptive purposes pursued here, limits the scope for multivariate analysis of the determinants of perceived effectiveness.

6. Summary, Conclusion and Recommendations

6.1 Summary of Findings

1. Farmers-herders conflict in Kogi Central is spatially concentrated, with two of five Local Government Areas accounting for 75.1 percent of 293 recorded incidents and clustering along transhumance corridors, forest margins and water points rather than in proportion to population.

2. The annual series is episodic rather than trending, peaking in 2016 and 2017 with 24.2 percent of all incidents in two years, reaching its minimum in 2020 under movement restrictions, and resuming an upward course from 2021.

3. Risk is seasonally concentrated, with 68 percent of incidents falling between November and February when southward transhumance coincides with the standing and harvested crop.

4. Community policing structures are widely known but weakly trusted, with awareness at 76.15 percent against perceived effectiveness of 29.36 percent, a gap attributable to absent logistics and contested impartiality rather than to lack of awareness.

5. The burden of the conflict falls principally on livelihoods, with crop loss reported by 71.6 percent of respondents against injury or death by 12.8 percent.

6.2 Conclusion

This study establishes that farmers-herders conflict in Kogi Central is neither randomly distributed in space nor evenly spread through time. It concentrates along identifiable corridors and within an identifiable season, which makes it, in principle, among the more tractable security problems facing the district. The analysis also establishes that climatic variability is better understood as governing the timing of pastoral movement than as directly generating conflict volume. What converts a seasonal encounter between two livelihood systems into recorded violence is the absence of institutions capable of arbitrating crop damage before it becomes reprisal. Climate supplies the context; governance determines the outcome. The corollary is encouraging, since governance is the variable over which the state retains control.

6.3 Recommendations

1. **Seasonally calibrated hotspot deployment.** Concentrate patrol resources on the Adogo, Itakpe and Okene corridors during the November to February window, and advance deployment by up to two months in years when seasonal forecasts indicate early forage failure in the northern rangelands.

2. **Demarcation and gazetting of transhumance corridors.** Use the mapped incident surface to delineate and formally gazette routes that avoid cropland, so that the path element of the conflict geometry is separated from the edge element.

3. **Provision of water and fodder reserves.** Establish dry season reserves along gazetted corridors to reduce the incentive for herds to enter cultivated land during the period of maximum crop exposure.

4. **Institutionalised joint peace forums.** Convene quarterly forums at Local Government Area level bringing together farmers, herders, traditional authorities and police, with documented outcomes, in order to build the shared expectations on which collective efficacy depends.

5. **Statutory backing and logistics for community structures.** Enact state legislation defining the mandate, jurisdiction and reporting lines of peace committees and vigilante groups, and provide a minimum logistics allocation. This addresses directly the two causes of the 46.79 point implementation gap documented in this study.

6. **Systematic recording of incident dates and coordinates.** Require divisional registers to capture the date and georeferenced location of each incident, which would permit the seasonal estimate reported here to be tested directly and would support continuous rather than retrospective hotspot analysis.

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Conflict of Interest

The authors declare no conflict of interest.

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Ethical Statement

Participation in the survey, focus group discussions and interviews was voluntary and informed consent was obtained from all participants. Respondents were assured of anonymity, and all quoted material is attributed by role and location rather than by name. Police records were obtained and used with the permission of the Kogi State Police Command.

Authors Contributions

Idris Shaib: conceptualisation, data collection, formal analysis, writing of the original draft. **Makanjuola Olayemisi Osagbemi:** supervision, methodology, validation, review and editing. **Musilimu Adeyinka Adetunji:** supervision, spatial analysis, visualisation, review and editing. **Alex Folorunsho:** data curation, cartography, review and editing.

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