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Feasibility of the KAZNET Information System for Climate Resilience and Conflict Mitigation in Kano State, Nigeria

Feasibility Study

September 2026



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Cover photo: Meshack Baraza/ILRI

Overview

The dynamic nature and compounding effects of shocks require more agile approaches to data collection. Such approaches should be built with a dynamic view of how multiple shocks develop and interact, often leading to complex and unpredictable outcomes. In Fragile and Conflict Affected Settings (FCAS), communities often face multiple shocks at the same time, making it difficult to disentangle discrete drivers and impacts. Innovations such as KAZNET offer an opportunity for longitudinal tracking of contextually relevant indicators, allowing for proactive monitoring of different shocks. Furthermore, inclusion of community members in the gathering of this information allows them to

1. Contribute to information gathering drawing on their personal experience of shocks and local knowledge.
2. Provide more nuanced information on a continuous basis.
3. Learn from the information as it is aggregated and shared back.

This approach not only improves data quality, but also provides a feedback loop mechanism, allowing communities to receive information collected and use it for decision support in relation to the unfolding risks they face.

In Kano and many other states in Nigeria, herders and farmers have created complementary and interdependent relationships. These benefit herders in the dry season through access to post-harvest crop residues while providing much needed manure and other animal products to farmers. Seasonal migration remains a critical component shaping and facilitating these relationships and has been employed for centuries as a strategy for navigating highly variable dryland environments. However, growing pressure from infrastructure development and shrinking farming land has contributed to rising tensions and occasional feuds among farmers and herders along migratory routes (known locally as *brutali* or *labi),* which have, in some instances, resulted in fatalities. A relationship once valued by both livelihoods is in jeopardy.

In terms of understanding this farmer-herder conflict, synchronic data would likely be insufficient to capture seasonality, dynamic and transforming drivers and impacts that span multiple timeframes. Therefore, to begin developing a rich diachronic dataset, researchers from ILRI and CDA conducted a scoping study to assess the feasibility of setting up KAZNET inclusive information system in Kano state. The specific objectives were threefold:

1. Identify the key migratory corridors.
2. Understand potential drivers of farmer-herder conflict and develop ways of tracking them.
3. Identify potential sentinel sites in Kano.

The rest of this document provides detailed information on the exercise conducted in Kano as part of the process of setting up KAZNET.

Background

In Nigeria, historic pastoralist migratory routes known locally as *burtali* or *labi* have existed for centuries. These routes were critical to the functioning of inter-livelihood relationships spanning farmers, herders, and semi-settled herders. However, they have been on decline in most parts of the country due to land use changes that have culminated in encroachment (Mustapha & Halliru, 2025). Herders used these routes to migrate closer to farmland after harvest time, accessing crop residue which served as additional nutrition for livestock during the dry season. Their livestock would deposit manure on the farmland being grazed, providing it with organic manure vital fertilization. This relationship was, broadly speaking, mutually beneficial. In more recent times, changing weather patterns combined with broader processes of environmental and economic change have generated new forms of rhythmic instability in a wider context of political instability. These changes have culminated in new forms of conflict.

Indeed, not only have many existing routes been restricted or blocked, but widespread insecurity has also led to the avoidance of various areas, including migration routes that are otherwise still open (Krätli & Toulmin, 2020). Confrontations between farmers and herders emerging from these evolving dynamics have, in many cases, become fatal. Krätli & Toulmin's (2020) report on violence incidents and fatalities in sub-Saharan Africa (SSA) between 2019-2020, which was based on Armed Conflict Location & Event Data (ACLED)[1]. The study notes that most of these incidents were in Nigeria (1,421 incidents with 4,168 fatalities). It is worth emphasizing here that the number of incidents involving pastoralists, either as perpetrators or victims, are a small fraction. Moreover, violence involving pastoralists is often unreported, due to low visibility of pastoral areas (Krätli & Toulmin, 2020).

Kano State is one of the thirty-six states in Nigeria located in the northwestern part of the country. The state is further divided into forty-four local government areas (LGAs). A significant number of residents practice seasonal agriculture, mostly rainfed and irrigated farming in areas along river Kano and its tributaries. The State majorly lies within Sudan savannah and northern Guinea agroecological zone. The rainfall pattern is unimodal, with only one rainfall season starting from May through to September, and with November to April regarded as the dry season. Recent changes in weather patterns have seen a shift in the onset of rainfall to June on a regular basis, with prolonged cessation in September and October. August is regarded as the wettest month (Mohammed et al., 2015).

[1] https://acleddata.com/about-acled

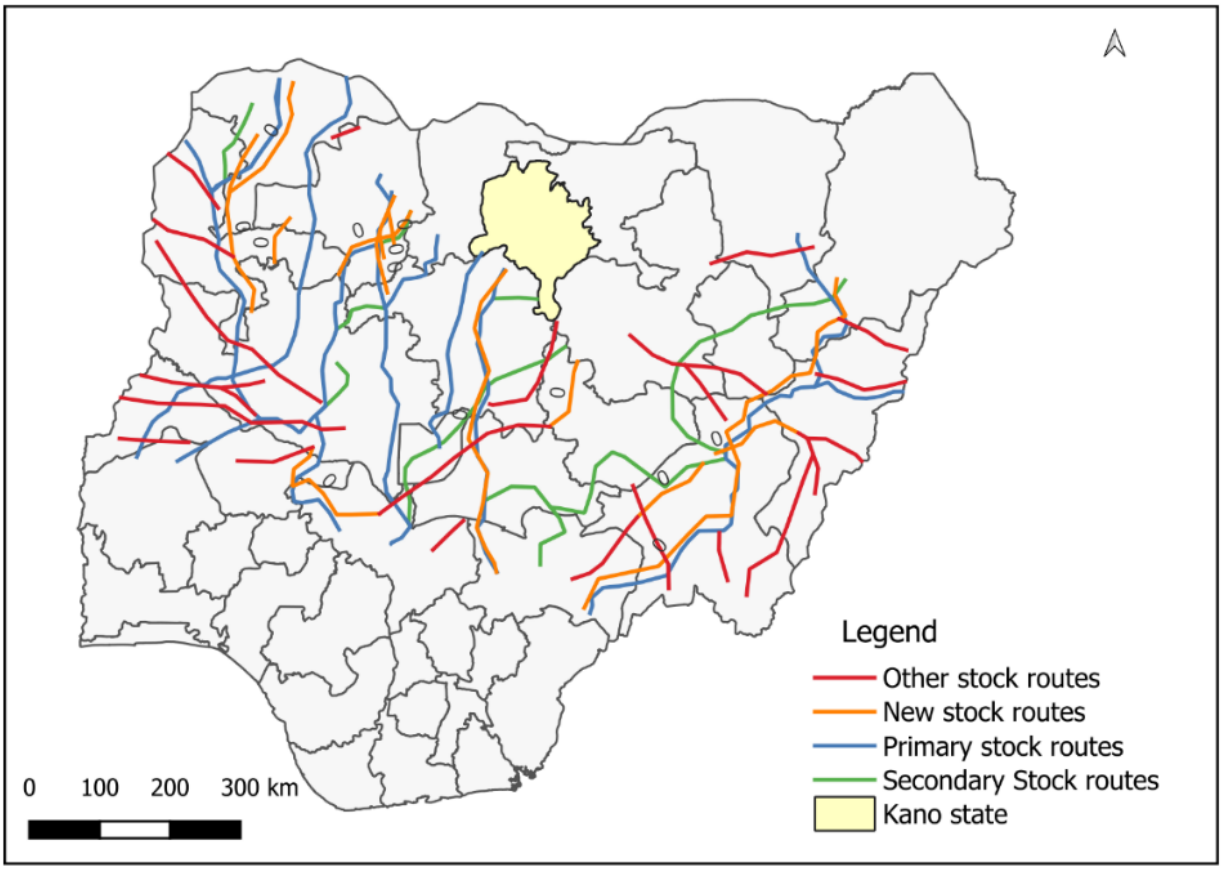


Figure 1: Stock routes source: Authors

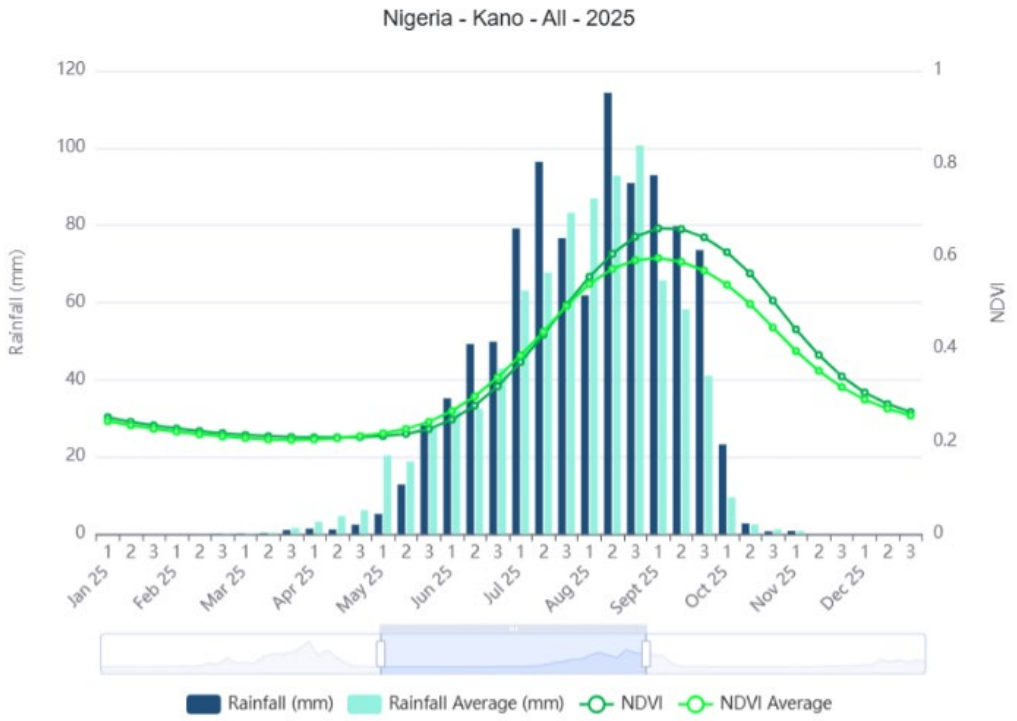


Figure 2: Kano rainfall and normalized difference vegetation Index (NDVI) source: WFP, VAM

Site selection

To get a grounded picture of the status and ongoing dynamics of farmer-herder conflict, a reconnaissance was conducted to build on previous efforts to understand local conceptions of risk (Derbyshire et al., 2025). This study focused on themes including changing land use practices, herder mobility, livestock migration routes, water access, and availability of grazing land, among others. Four Local Government Areas (LGAs) were purposefully selected due to the presence of both herders and farmers and reported rising cases of conflict.

The selected study sites (Tudun Wada, Bagwai, Shanono, and Kura LGAs) represent landscapes where seasonal livestock migration, expanding irrigation, evolving market systems, and changing land use are progressively influencing rural economies. In this regard, Kano is a highly suitable location for exploring broader questions about shifting dynamics of crop-livestock integration, resource competition, and community resilience.

A participatory approach was used to elicit information on livelihood, migration, mobility, market, and conflict. Gender disaggregated focus group discussions were conducted in each of the selected LGA. Further disaggregation by livelihood strategy was undertaken to enable an understanding of the specific factors constraining each production strategy.

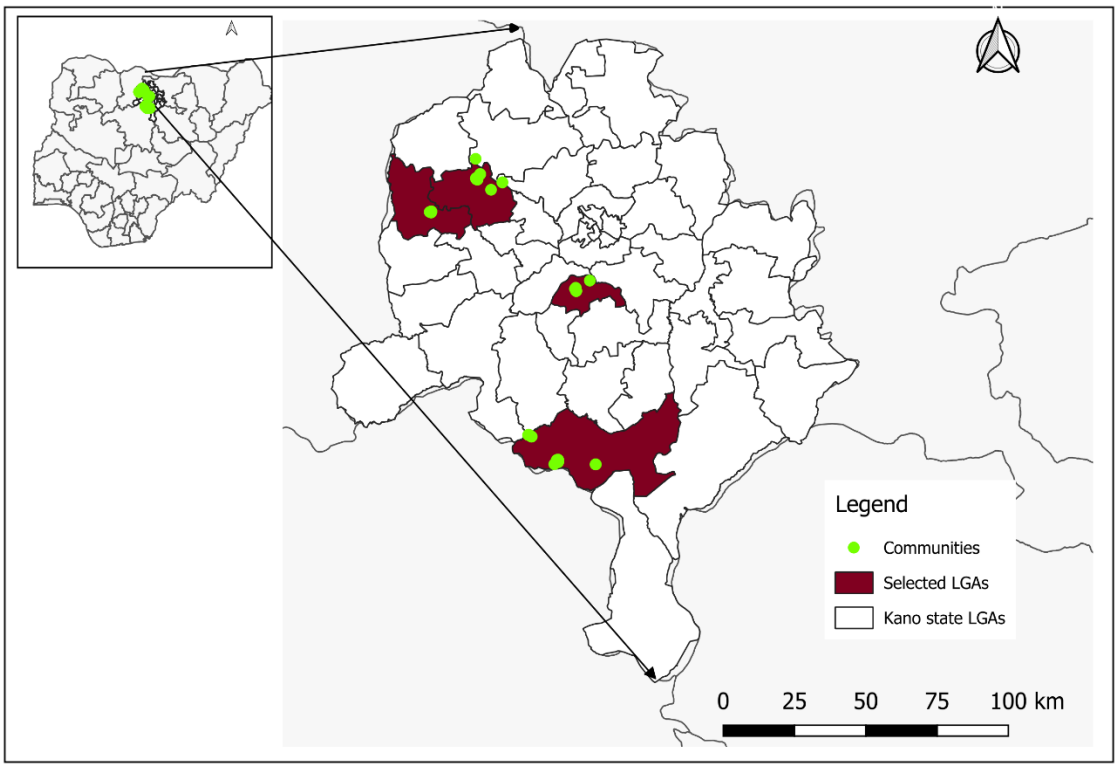


Figure 3: Selected areas for KAZNET deployment *source: Authors*

i. Tudun Wada

Tudun Wada lies in the southern part of Kano State, bordering Kaduna State to the southwest. It is home to vibrant farming communities crosscut by migratory stock routes that connect herders to the southern stock route to neighboring Jigawa, Bauchi and Yobe States. Tudun Wada hosts Falgore Game Reserve, which also serves as a grazing area for herders.

ii. Kura

Kura is located at the center of Kanu state, the LGA is predominantly a rice production area, with some presence of semi-settled herders who maintain a base camp in the area while their livestock migrate to other regions as far away as the Niger Republic.

iii. Bagwai

Bagwai is in the northwest corner of Kano state, forming a corridor connecting Katsina, Zamfara and the upper part of Jigawa States. Bagwai is part of the northern migratory stock routes through Jigawa state to Niger Republic.

iv. Shanono

Shanono is in the northwest part of Kano state, bordering Katsina State to the west and Bagwai LGA to the east. It forms part of the north migratory stock route and is home to both herders and farmers.

Livelihoods

The main livelihood systems in the selected LGAs are farming, herding, and marketing (of farm produce and livestock). Communities in the four LGAS mostly rely on rain-fed agriculture.

Those along the Kano River and its tributaries farm all year round, through irrigation. A variety of crops are grown, including maize, rice, sorghum, wheat, ground nuts, soya beans, pepper, garlic, onions and tomatoes. The farming communities occasionally practice livestock fattening in the dry season using crop residues. The fattened animals are later sold, and income used to purchase farm inputs in planting season. Most of the fattened livestock are bulls and rams. Fishing is also practiced in some of the villages close to Tiga Dam.

Herders mainly rely on animal husbandry as a livelihood system, with very few practicing seasonal crop production. Cattle, sheep and goats are the main reared livestock, with cattle dominating a larger share of ownership. Herders utilize cow manure and milk as additional sources of income, especially in semi-settled communities, who leave a few animals at home while the larger part of the herd migrate to other nearby states, and as far away as Niger, Chad, and Cameroon.

Mobility and migration

Seasonal migration by herders has been employed following a defined longstanding movement plan that allows migrating herds to access water, pasture, markets, veterinary services and avoid insecure places (Krätli & Toulmin, 2020). Many decades, indeed, centuries of migration are what led to the establishment of stock routes that are currently threatened.

In the selected LGAs, we observed three scenarios related to mobility.

1. **Farming communities** rarely shift, and the farming is mostly within their permanent settlement, with farming areas and settlement clearly demarcated.
2. **Semi-settled herders**, these are herders who practice partial migration where a base camp has been maintained for close to 30 years, and some part of their herd migrates to other states and countries with other family members. This is somehow similar to the set up in East Africa.
3. **Nomadic herders**, these are herders who move with the whole family and the herd following the traditional system of nomadic pastoralism.

Markets

Markets play a critical role in aggregating farm produce and livestock for sale. In most LGAs, grain markets are present with a multi-week market schedule in some cases, especially those that specialize in farm produce. For example, in Tudun Wada LGA, there is a farm produce market that runs four days a week, with small ruminants sold, but not in large numbers. Each LGA has at least one farm produce market with a limited supply of small ruminants.

Livestock markets with cattle are more specialized and serve several LGAs. They function as aggregating sites for livestock to be transported outside Kano State as far as Abuja and Lagos. Kwanar Dangora, Falgore and Getso market are the main livestock markets covering the selected LGAs. Unlike in many parts of East Africa, markets in Kano seem to be more specialized, where grain markets are mostly utilized for farm produce and small ruminants while cattle markets seem to be more focused on aggregation. Table 1 shows the markets and their schedule.



Figure 4: Livestock and commodity market activities in Kano State, Nigeria

In farm produce markets, grains from the farmers are sold, milk and meat are sold as well. Although unlike East Africa, fresh milk is not offered for sale in the market, and only cattle milk is present. We observe that milk is first fermented and offered in the market as fermented milk.

Table 1: List of both produce and livestock markets

Market	Cycle	Day of the week (Main market day)	Physical location
1. Kwanar Dangora	weekly	• Friday	Kafin Maiyaki, Kiru LGA
2. Tudun Wada	4 times a week	• Sunday	Tudun Wada
3. Falgore	weekly	• Friday	Falgore, Doguwa LGA
4. Rahma round	2 times a week	• Saturday • Tuesday	Rahma, Bebeji LGA
5. Bichi	weekly	• Friday	Bichi LGA
6. Badume	2 times a week	• Wednesday • Sunday	Bichi LGA

7. Getso	Weekly	• Monday	Getso town, Gwarzo LGA
8. Shanono	Weekly	• Monday	Shanono town
9. Kura	Weekly	• Friday	Kura town
10. kwanar Gafan	Weekly	• Thursday	Gafan town, Garun malam LGA

The Potential of KAZNET

KAZNET was developed to provide a low-cost infrastructure for collection of information that would otherwise be cost prohibitive using traditional survey methods. Over the years KAZNET's role in information generation and access has greatly increased, providing information in different contexts, while expanding the scope of indicators collected. This agility has been the center and the motivation for KAZNET innovation development. For Instance, in northern Kenya and southern Ethiopia, KAZNET continues to play a central role in high frequency data gathering and dissemination in drylands.

Kano provides a unique setting, where KAZNET might be deployed to gather information on conflict dynamics among herders and farmers. The agility of KAZNET will allow for modification of tasks to suit the context, while retaining the core module[2]. The pre-set-up scoping has provided a basis for contextualization and adaptation of modules to capture conflict dynamics. Through scoping, the research team evaluated the viability of setting up KAZNET in a context without rangelands, as most of the area in question is under crop cover. While this posed a challenge, it is not the singular most important aim for the set up in the context, therefore, the rangelands task is omitted from the Kano set up.

In conclusion, Kano presents an entry for KAZNET to drylands in West Africa. As shocks emerge and evolve, KAZNET's role will likewise shift, catering to emerging needs and challenges. While the context differs, most of the core modules remain relevant and therefore allow for seamless deployment, with minimal contextual adaptation that will not interfere with the wider network of KAZNET platform contributions.

Some key foci for the coming months and years include:

1. Farming calendars.
2. Emergence of dry season farming.
3. Changes in types of crops sowed by farmers.
4. Pastoralist movement in response to insecurity along traditional routes.

[2] These are modules that constitute key household production and welfare indicators, and Market dynamics indicators.

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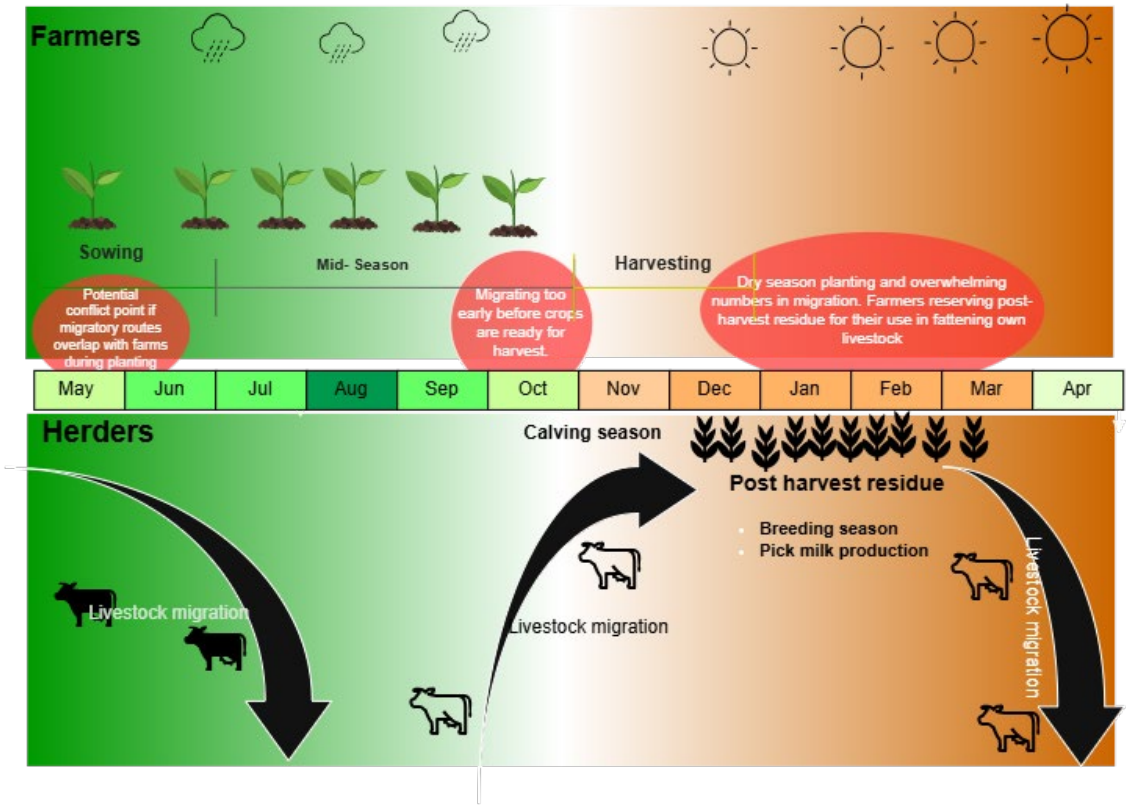
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Appendix: Kano state seasonality and farmer-herder interaction depiction.





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