Title: Is there a religious dimension to concern about farmer-herder conflicts in Nigeria?

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Abstract

Many studies have been conducted on the conflicts between Fulani nomadic herders and sedentary farmers over land and water resources in Nigeria, but very few have examined the religious dimension of these conflicts. In fact, some studies have described explanations that focus on the religious dimension as oversimplifications of a complex social problem. But is this really the case? Is religion important in understanding the dynamics of the conflict? My regression results show that Muslim affiliation and the predominance of Muslims in a local government area (i.e., municipality) negatively correlates with concern about farmer-herder conflicts. A plausible mechanism behind this finding is that Islam, which is the religion shared by the Fulani nomadic herders and the Muslim sedentary population, allows trust to be easily established between members of the two groups, which in turn lowers the likelihood of disputes over land and water resources turning violent.

JEL classification: D74, N57, Q24, Q25, Z12

Keywords: *Farmer-herder conflict, Pastoral conflict, Religion, Trust, Nigeria*

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1. Introduction

Conflicts between nomadic Fulani herders and sedentary farmers are not a recent phenomenon in Nigeria. Writing six years after Nigeria's independence from British colonial rule, Ibrahim (1966) highlighted the tendency for conflicts to occur between both actors when cattle strayed into farmlands and destroyed crops: "There is thus a continual struggle between Borori [nomadic Fulani herders] and farmers, and when a dispute goes to the courts—it does in the majority of cases—it invariably ends in the Bororo paying heavy compensation for damage to crops." (p. 174). Contemporary farmer-herder conflicts differ from those that occurred in earlier times in two respects: First, earlier conflicts were not violent, and second, legal remediation was often used to resolve them. By contrast, contemporary conflicts are characterized by the frequent use of violence as a means of dispute resolution (Human Rights Watch 2018; Egunyomi 2018; Godwin 2018; Stein 2016). This often leads to a downward spiral of revenge whereby conflict begets conflict, with each attack creating the conditions for a reprisal attack (Olufemi 2021; Bagu & Smith 2017). Some scholars have referred to this phenomenon as the "conflict trap" (Collier 2007; Collier et al. 2003).

Data from the Armed Conflict Location and Events Database (ACLED) (Raleigh et al. 2010) shows that between 1997 to 2023, there were 8,651 incidents in which at least one of the conflict actors was a herder.[1] These incidents caused a total of 29,681 fatalities. Although 38 countries were affected by the conflict, Nigeria alone accounted for 30 percent of the total incidents and 45 percent of the total fatalities. Of the 2,600 incidents that occurred in Nigeria between 1997 to 2023, 77 percent of them caused at least one fatality, which underscores the violent nature of these conflicts. Because the opposite parties to the conflict are mostly sedentary communities engaged in crop cultivation, these conflicts are often referred to as *farmer-herder* conflicts. A characteristic of farmer-herder conflicts worth highlighting is their spread across all of Nigeria's 36 states, including the federal capital territory, Abuja. This differs from the attacks perpetrated by the

[1] In the ACLED dataset, the term "pastoralist" was rather used. I use the terms "herder" and "pastoralist" synonymously in this study. To access the ACLED dataset visit: https://acleddata.com/

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radical Islamist group *Boko Haram*, which is largely confined to a few states in Northeastern Nigeria. Between 1997 to 2023, all of the states recorded at least one conflict incident involving a herder; 30 of them recorded at least 10 incidents. In the states of Benue, Plateau, and Kaduna, which are the three most affected states, 473, 389, and 263 incidents were recorded respectively.

Moreover, 98 percent of the 2,600 total incidents happened after 2009. There appears to have been a surge in the incidence of conflict in the years after 2009 compared to the years before.[2] The year 2009 marked the advent of *Boko Haram* insurgency (Adesoji 2010).[3] George et al. (2022) studied the impact of *Boko Haram* attacks on farmer-herder conflicts and found that the former caused the latter. Nomadic herders have been displaced from their primary grazing areas by *Boko Haram* attacks, forcing them to migrate with their livestock to safer areas. This has led to increased competition for land and water resources in host communities between nomadic herders and the resident population, which in turn has increased the risk of conflict. They have also highlighted the tendency for some resident communities to associate nomadic herders, who are primarily Muslim and belong to the Fulani ethnic group, with *Boko Haram* insurgents. This has led to distrust in the nomadic herders and a higher risk of conflict.

Furthermore, the *Boko Haram* insurgency and the general trend of insecurity in the Sahel Region has resulted in the proliferation of small and light weapons (United Nations Peacekeeping 2020; Ojo 2020; Blench 2019), leading to a militarization of nomadic herders, who now carry arms to protect themselves against potential attacks. "A lack of established relationships with local farmers, as well as the psychological insecurities related to war, kidnapping and rustling, makes the incoming herders more likely to use their weapons to defend their herds." (Blench 2019, p. 12). Sedentary communities engaged in crop cultivation have also resorted to arming themselves, especially given the failure of Nigeria's security agencies to provide adequate security (Abati 2024;

[2] See Table A4 in the appendix.
[3] *Boko Haram* is a radical Islamist group that vehemently opposes the westernization of Nigeria. It seeks to establish a caliphate governed strictly by Islamic law. See Anugwom (2019), Faluyi et al. (2019), and Walker (2016) for more information on the origin of the group, its motivation, and the scope of its activities.

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New Telegraph 2024; Kasa et al 2023; Sadiq et al. 2021). This leads to a scenario where conflicts over land and water resources, which might have been resolved amicably between farmers and herders in the absence of weapons, turn violent. The advent of the *Boko Haram* insurgency ushered in a new phase of systematic violence in Nigeria that it had never before witnessed. At the height of *Boko Haram's* activity, the Nigerian government was diverting most of its attention and resources towards fighting the group, especially because of its wanton and indiscriminate use of violence in the pursuit of its objectives. This might have prompted the government to neglect lower intensity conflicts, thus allowing them to fester. Moreover, the inability of the Nigerian government to deal decisively with *Boko Haram* may have eroded trust in the state's security apparatus. It may also have led to the normalization of violence and apathy among the population, which in turn may have made people less hesitant to employ violence in the resolution of conflicts.

Some studies contend that the adverse effects of climate change—droughts, desertification, and rising temperatures—are at the root of farmer-herder conflicts (Madu & Nwankwo 2021; Eberle et al. 2020; Day & Caus 2020; International Crisis Group 2017). A look at Nigeria's topography shows that the Northernmost part of Nigeria is proximate to the Sahara Desert, while the Southernmost part is contiguous to the Atlantic Ocean. The amount of rainfall and vegetation cover increases as one moves from the North towards the South. The adverse effects of climate change have depleted pasturelands and water sources, forcing nomadic herders to move southwards in search of these. This puts nomadic herders at odds with farmers in host communities. Land and water are essential inputs for both farmers and herders: Farmers need land to cultivate their crops and water for irrigation, especially during the dry season, when there is no rain. Herders need pastureland and water for their livestock to graze and drink.

But is there a religious dimension to farmer-herder conflicts? Does religious affiliation influence how Nigerians respond to these conflicts? Or is the focus on the religious angle of the conflict merely an oversimplification of a complex social problem? Ajala (2020) argues that focusing on the religious dimension of farmer-herder conflicts diverts attention from the core

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issues at stake, sowing the seed of distrust and inter-communal animosity. This in turn creates an enabling environment for the elites to exploit ethnoreligious divisions among the Nigerian population in furtherance of their political goals. Blench (2019, p. 12) observes that farmer-herder conflicts are often "seized on by irresponsible politicians and social media commentators to frame the clashes in religious terms, a narrative which suits those who like simple, science-free analyses, which also justify the irresponsible exercise of political power." However, Campbell and Page (2018, p. 83) observe that "Where religious boundaries coincide with those of ethnicity and land use, conflict can be frequent and intense, as it is in parts of the [Nigerian] Middle Belt."

This study seeks to examine the relationship between religion and concern about farmer-herder conflicts in Nigeria. More specifically, it investigates whether Muslim affiliation and the predominance of Muslims in an area leads to lower concern about farmer-herder conflicts. I operationalize concern about farmer-herder conflicts as the fear of being victimized. Although some studies have referred to the religious angle of farmer-herder conflicts, they are mostly qualitative (e.g., Nwankwo 2024; Nwozor et al. 2021; Chukwuma 2020). There is generally a dearth of large-N quantitative studies examining the religious dimension of farmer-herder conflicts in Nigeria. Relying on survey data obtained from Afrobarometer (BenYishay et al. 2017), the Demographic Health Survey (DHS), and the Transnational Perspectives on Migration and Integration (TRANSMIT) research project, this study seeks to fill this gap.

It is important to study the religious dimension of farmer-herder conflicts because ignoring it prevents a holistic examination of the conflict. Given the unique cultural identity of the herders, who are mainly Muslims and belong to the Fulani ethnic group, coupled with the fact that Nigeria has a history of conflict between its two major religious groups (i.e., Muslims and Christians) (Tuki 2024; Angerbrandt 2018; Agbiboa 2013), farmer-herder conflicts are often viewed through a religious lens (Parsons 2023; Christian Association of Nigeria 2018). Suffice it to add that Religion has played a central role in shaping Nigeria's trajectory from the precolonial period up to the present (Vaughan 2016; Kukah 1993; Ibrahim 1991). Moreover, Nigeria's population is almost

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evenly split between Christians and Muslims (Campbell & Page 2018, p. 72).

This study finds that both Muslim affiliation and the predominance of Muslims in a local government area (LGA) (i.e., municipality) area are negatively correlated with concern about farmer-herder conflicts. In other words, individuals residing in an LGA with a predominantly Muslim population are less concerned about farmer-herder conflicts than individuals residing in LGAs with a predominantly Christian population. At the individual level, Muslims are less concerned about farmer-herder conflicts than Christians. A plausible mechanism underlying these results is that the common religion of Islam shared by the nomadic Fulani herders and the Muslim sedentary population allows for trust to be established more easily between members of the two groups, thus allowing amicable resolutions to conflicts over land and water resources. A lower incidence of conflict in turn leads to less concern about farmer-herder conflicts. The regression results also show that compared to Christians, Muslims are more likely to think that the intensity of farmer-herder conflicts have declined compared to the previous year. Moreover, Muslims tend to assess the Nigerian government's effort at resolving intercommunal conflicts more favorably than Christians.

This study proceeds as follows: Section 2 discusses the literature on intergroup conflict with a particular emphasis on homophily and states the hypotheses. Section 3 describes the data upon which this study relies, operationalizes the variables that will be used to estimate the regression models, and discusses the empirical strategy. Section 4 presents the regression results and discusses them, while Section 5 summarizes the study and concludes.

2. Theoretical considerations

Some studies have shown the tendency for people with similar characteristics to get along—a phenomenon referred to as homophily. McPherson et al. (2001, p. 416) defined homophily as "the principle that a contact between similar people occurs at a higher rate than among dissimilar people." In his classic book entitled *The Nature of Prejudice*, Allport (1954) used the term "separateness" rather than "homophily" to describe the proclivity among people to establish

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relationships with those who shared similar characteristics like race, class or ethnicity. Separateness, he argued, was not necessarily driven by prejudice, but rather by convenience. This is because "It requires less effort to deal with people who have similar presuppositions." (Allport 1954 p. 17). However, he also noted that separateness could undermine communication across groups, exaggerate group differences, and lead to conflicting interests. Similarly, Eke (2022) observes that segregation along ethnoreligious lines fosters polarization because it cuts off the channels for communication and dialogue across groups, leading to the perception of outgroup members as threats. This in turn increases the risk of conflict. In another study where he specifically focused on nomadic Fulani herders, Eke (2020) found that whenever they migrated to Southern Nigeria, they often developed their own distinct communities separate from the host population. While he acknowledges that segregation might be partly driven by the desire of the Fulani herders to maintain their unique cultural identity, hostility towards Fulani nomadic herders by the host population might also underlie this pattern. This is because herders are often perceived as being backwards, uncivilized, and having a high predisposition toward violence. Allport (1954) recommended more intergroup contact as a way to reduce frictions between groups. For such contact to yield positive results, some conditions were necessary: the groups needed to be willing to cooperate rather than compete, they needed to work towards a shared goal, and they had to be of equal status.

Some empirical studies have found support for religious homophily. In an experimental study conducted in France, Adida et al. (2015) found that religion was the strongest predictor of homophily. Other socio-demographic factors like race, ethnicity, age, gender, and class were statistically insignificant in their model. Moreover, their results showed that the preference for associating with people of a similar religious belief was present across the different religious categories which included Muslims, Christians and atheists. Yilmaz and Bashirov (2022) conducted a qualitative study among Australian Muslim youths to determine the mechanisms behind religious homophily. Their results, which are based on 64 semi-structured interviews, showed that the "drinking culture" among the Anglo-Australian majority population made Australian Muslims

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reluctant to develop close friendships with them. Moreover, they found that "Religious homophily overrode ethnic differences, allowing young Muslims to build friendships with other Muslims from various parts of the Muslim world." (p. 8). Analyzing data from a longitudinal study conducted in the state of North Rhine-Westphalia in Germany, Leszczensky and Pink (2017) examined the effect of religion and religiosity on intra and inter-group friendship among adolescents in nine schools. They found that religion was a stronger predictor of homophily than religiosity. Both Christian and Muslim youths preferred having people of the same religion as friends. Moreover, they found that "Christian and non-religious youths…were more hesitant to befriend their Muslim peers than each other." (p. 80).

Some studies have focused specifically on ethnic homophily. Jacquemet and Yannelis (2012) conducted a correspondence test to determine whether ethnic homophily influenced hiring discrimination in the Chicago labor market. They sent out identical resumes for a job, with the names on the resumes signaling the ethnicity of the applicants. Resumes with Anglo-Saxon names received about one-third more callbacks than the other two categories of resumes that either had African-American names or "foreign names" with no particular ethnic association. Moreover, they found higher levels of discrimination among employers located in suburban areas characterized by a lower level of ethnic diversity than those who were in cities. A limitation of their study is that they had no information about the individual making the hiring decision and went with the assumption that he/she was white. In a study conducted among secondary school students in The Netherlands, Stark and Flache (2012) found that friendship among students belonging to the same ethnic group in ethnically heterogeneous schools was not necessarily driven by preference for people of the same ethnicity, but rather by preference for friends with similar opinions towards a common interest. This was especially so when ethnicity correlated with opinions towards certain shared interests. The implication of their results is that ethnic homophily was rather an unintentional outcome.

Returning to the Nigerian case, I expect that Muslim affiliation and the predominance of

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Muslims in a local government area (LGA) (i.e., municipality) would both be negatively correlated with concern about farmer-herder conflicts. Put differently, individuals residing in a municipality where the population is predominantly Muslim would be less concerned about farmer-herder conflicts than individuals residing in a municipality where the population is predominantly Christian. Moreover, Muslims would be less concerned about farmer-herder conflicts than Christians. This is because the common religion of Islam shared by the nomadic Fulani pastoralists and the sedentary population who are predominantly Muslim, reduces the likelihood of disputes over land and water resources turning violent. Moreover, whenever disputes arise, they could appeal to a religious authority whom they both hold in high regard, which then lowers the likelihood of the dispute turning violent. A lower incidence of conflict in turn might lead to people being less worried about being victimized. Conversely, in municipalities with a predominantly Christian population, disputes over land and water resources might be more likely to turn violent because of the religious difference between the conflict actors, which lowers the likelihood of trust being established between them. An increase in the incidence of conflict could in turn lead to increased concern about being victimized. This argument is congruent with observation made by Eke (2020, p. 754): "Public discourse around the [farmer-herder] conflict shows patterns that mirror the ethno-political divide between the Christian-dominated south and Muslim-dominated north, and that show a lack of faith in security agencies." Similarly, Coleman (1958, p. 39), writing two years before Nigeria's independence from British colonial rule, noted that "Islam provided a transtribal bond which has been one of the most powerful integrative factors in Northern Nigeria." The discussion so far leads the following hypotheses that this study seeks to test:

H1: *The predominance of Muslims in an area negatively correlates with concern about farmer-herder conflicts*

H2: *Muslim affiliation negatively correlates with concern about farmer-herder conflicts.*

3. Data and methodology

This study relies primarily on the Round 7 Afrobarometer (BenYishay et al. 2017) survey data that

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was collected in 2017.[4] The dataset consists of 1600 observations and is representative for Nigeria's population. Data were collected from each of Nigeria's 36 states plus the federal capital territory, Abuja. Respondents were at least 18 years old. Out of Nigeria's 774 local government areas (LGAs) (i.e. municipalities), data were collected from 147 of them.[5] Males and females were equally represented in the sample in the ratio 50:50.

I supplemented the Afrobarometer dataset with data obtained from the Demographic Health Survey (DHS) and novel survey data collected as part of the Transnational Perspectives on Migration and Integration (TRANSMIT) research project. I discuss the DHS dataset succinctly in the subsection where I operationalize the explanatory variable, and the TRANSMIT dataset in section 4 where I discuss the mechanisms. Table A1 in the appendix presents the summary statistics of the variables used to estimate the regression models.

Operationalization of the variables

Dependent variable

Concern. This measures the degree to which respondents worry that they would be victimized by farmer-herder conflicts. Respondents were first asked whether they were aware of farmer-herder conflicts; those who had at least a little bit of knowledge about the conflict were then asked how concerned they were about it. Of the 1,448 respondents who were asked the first of these questions, 281 of them said they were unaware of the conflict. It is possible that some respondents had said they were unaware of the conflict because they did not want to talk about it.

[4] To access the Afrobarometer data and the survey questionnaire, visit: https://www.afrobarometer.org/
[5] Each state in Nigeria consists of three senatorial districts, and the senatorial district consists of local government areas (LGAs).

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Figure 1: Religious and gender distribution of awareness about farmer-herder conflicts

Note: The figure shows the degree to which respondents are aware of farmer-herder conflicts based on religious affiliation (i.e., Muslims and Christians) and gender (men and women). The x-axis for both bar charts show the number of respondents who are Muslims and Christians, as well as those who are males and females. The y-axis for both bar charts shows the percentage of respondents associated with the various response categories.

To better understand the non-response patterns, I plotted the responses to the question asking respondents whether they were aware about farmer-herder conflicts on a stacked bar chart where I disaggregated the data based on religious affiliation (i.e., Muslims and Christians) and gender (men and women). As shown in Figure 1, Christians were a bit more likely to say that they had heard "nothing at all" about farmer-herder conflicts than Muslims. Moreover, women were more likely than men to say they had heard "nothing at all" about the conflict. However, the

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differences across the subgroups are not very large. Because the subsequent question "How concerned are you about the conflicts between farmers and herdsmen?" from which I derived the dependent variable was asked to only the subsample of respondents who had heard at least "a little bit" about farmer-herder conflicts, I used this subsample of respondents to estimate the regression models. The responses to this question were measured on a scale with four ordinal categories ranging from "not concerned at all" to "very concerned." For easy interpretation of the regression results, I inverted the ordinal values assigned to the response categories by subtracting each of them from 5. This allowed for larger ordinal numbers to denote a higher level of concern and vice versa.

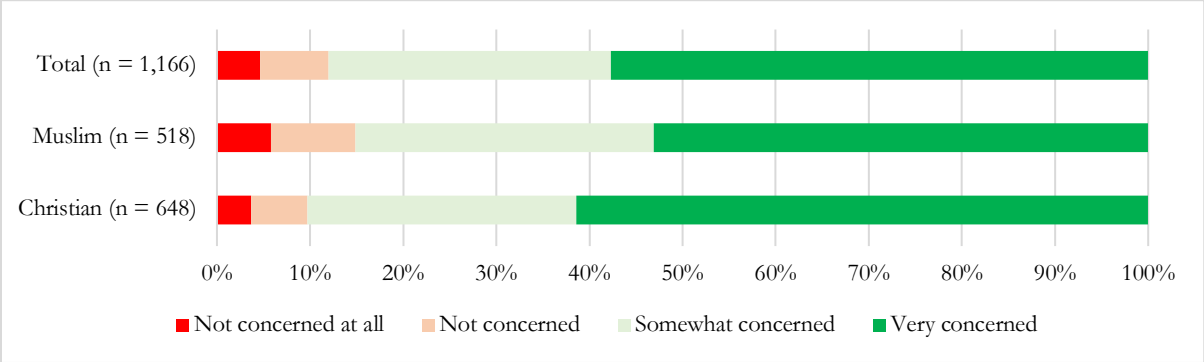

Figure 2: Religious affiliation and concern about farmer-herder

Note: The figure shows the distribution of responses to the question asking respondents how concerned they are about farmer-herder conflicts. The y-axis shows the total number of respondents who were asked the question, and the subsample of respondents based on religious affiliation (i.e., Muslims and Christians). The x-axis shows the percentage of respondents associated with the various response categories.

Figure 2 visualizes the variable measuring concern about farmer-herder conflicts on a stacked bar chart. Most Nigerians are bothered about farmer-herder conflicts. Of the 1,166 total respondents who were asked this question, 88 percent of them chose either the "very concerned" and "somewhat concerned" response categories, while only 12 percent chose either the "not concerned" or "not concerned at all" response categories. Breaking down the data based on religious affiliation revealed that Muslims are slightly less concerned about farmer-herder conflicts than Christians. While 15 percent of Muslims chose either the "not concerned" or "not concerned at all" response categories, the estimate for Christians was 10 percent.

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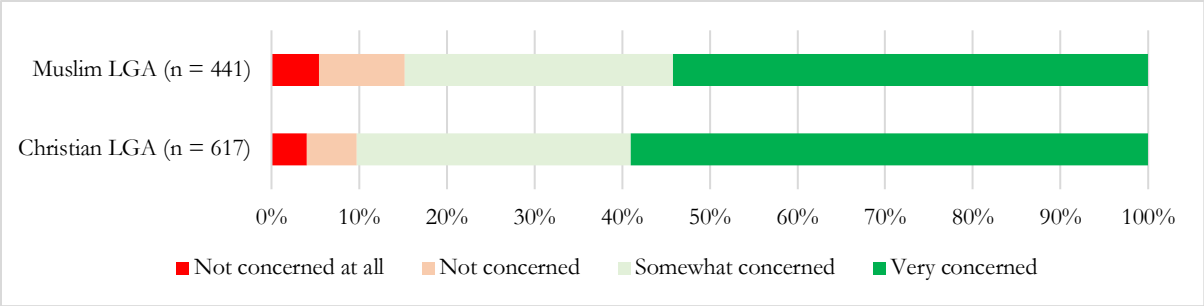

Figure 3: Religious predominance and concern about farmer-herder

Note: The figure shows the distribution of the responses to the question regarding concern about farmer-herder conflicts based on the predominance of Muslims and Christians in the local government area (LGA) where the respondent resides. The y-axis shows the number of respondents residing in an LGA with a predominantly Muslim population and a predominantly Christian population. The horizontal axis shows the percentage of respondents associated with the various response categories.

I also broke down the data based on the predominance of either Muslims or Christians in the local government area (LGA) (i.e., municipality) where the respondents resided. As shown in Figure 3, respondents residing in LGAs with a predominantly Muslim population were slightly less concerned about farmer-herder conflicts than those residing in LGAs with a predominantly Christian population. Because most of the respondents chose the "very concerned" and "somewhat concerned" response categories, I developed an alternative measure of the dependent variable where I coded the "very concerned" and "somewhat concerned" responses as 1, and the "not concerned at all" and "not concerned" responses categories as 0. I used this binary variable to conduct a robustness check.

Explanatory variables

Dominant Muslim. This is a dummy that takes a value of 1 if the local government area (LGA) (i.e., municipality) where the respondent resides has a predominantly Muslim population and 0 if the population is predominantly Christian. Censuses are irregular in Nigeria. In the rare cases when they are conducted, information about religious affiliation is usually not collected, making it difficult to obtain data on the religious composition of the population from official government sources. Although Nigeria's last census was conducted in 2006, the 1963 census is the only one where information about religious affiliation was collected (Ostien 2012). Due to this limitation, I extrapolated the religious composition of the population in the respective LGAs from a shapefile

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containing the geolocations of the religious infrastructure (i.e., churches and mosques) across Nigeria. I obtained this data from the Georeferenced Infrastructure and Demographic Data for Development (GRID3) database.[6] Except for one state (i.e., Osun) for which data is unavailable, the dataset covers all Nigeria's 36 states plus the Federal Capital Territory—Abuja. The dataset contains a total of 55,482 places of worship (i.e., 33,103 churches and 22,379 mosques). The shapefiles for Nigeria's LGA administrative boundaries were developed by the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA).[7]

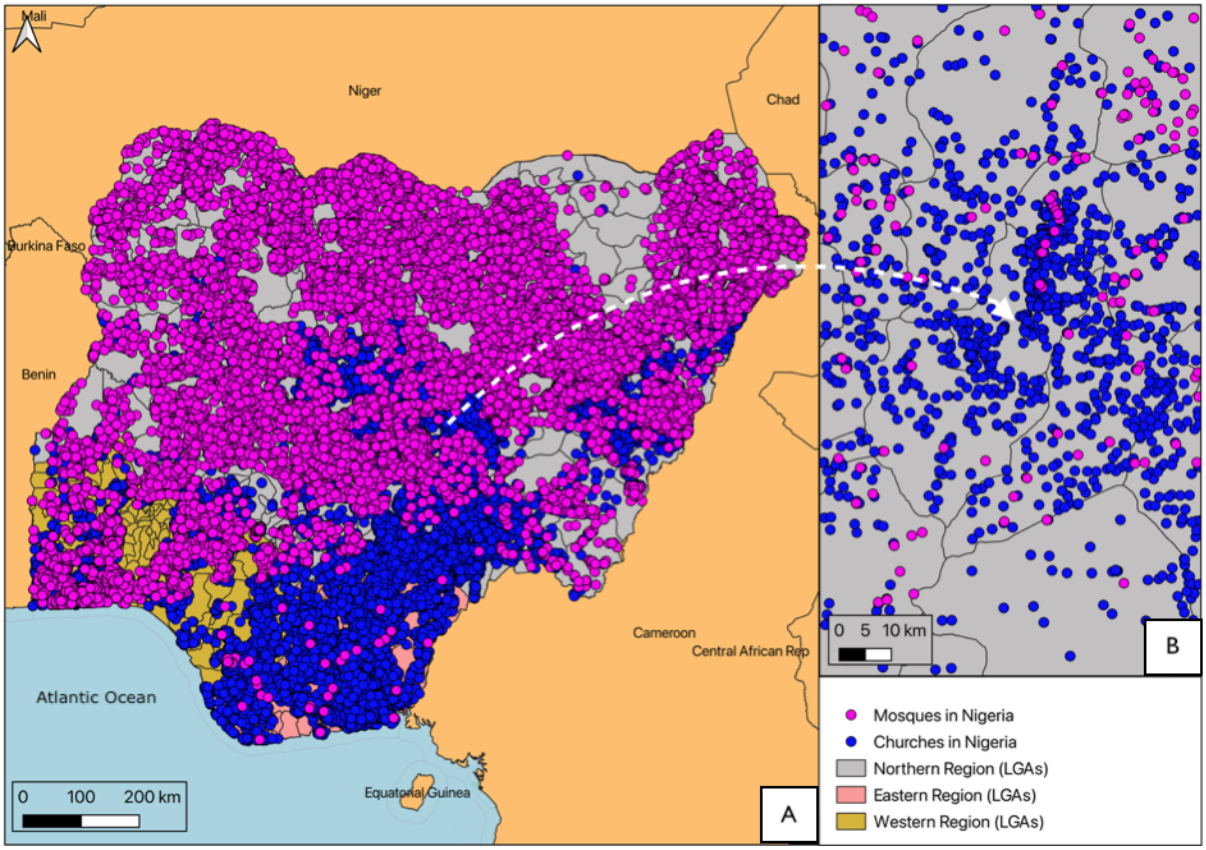

Figure 4: Religious infrastructure across Nigeria

Note: The figure shows the geolocations of the churches and mosques across Nigeria rendered over a map showing the administrative boundaries of the local government areas (LGAs) that constitute Nigeria's three major regions (i.e., Northern, Eastern, and Western Regions). Panel A shows a broad country-level picture, while Panel B zooms in on an enclave in Northern Nigeria that has a predominantly Christian population.

Using QGIS software, I computed the total number of mosques and churches in the respective LGAs, and subsequently matched the geolocations of the respondents with the

[6] The GRID3 data for religious infrastructure was collected between November 2017 to December 2018. It could be accessed here: https://grid3.gov.ng/

[7] The shapefiles containing Nigeria's administrative boundaries can be accessed here: https://data.humdata.org/dataset/nga-administrative-boundaries

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particular LGAs where they reside. This was possible because the Afrobarometer survey dataset is georeferenced. I developed a dummy variable which I coded as 1 if an LGA had more mosques than churches. I considered these LGAs as having a predominantly Muslim population. Conversely, when an LGA had more churches than mosques, I coded the dummy variable as 0, which indicates that the LGA has a predominantly Christian population. In the few cases where the LGA had neither a church nor mosque, or had equal number of churches and mosques, I treated the observation as missing. This rarely occurred as there were only seven observations where the number of churches and mosques were equal. Each of these observations had only one mosque and one church.

Figure 4 visualizes the geolocations of mosques and churches across Nigeria. I deliberately rendered the layer showing the mosques above that for the churches so I could better identify where mosques are clustered. A cursory look at the figure shows that mosques are concentrated in the Northern Region, with a couple of enclaves therein where the population is predominantly Christian. As will be discussed later, these enclaves have historical roots. In the Eastern Region, the population is predominantly Christian, with Muslims being a small minority, as evidenced by the sparse number of mosques there. Both religious groups are almost evenly represented in the Western Region.[8]

One might argue that religious infrastructure does not adequately capture the religious composition of the population in the LGAs. This prompted me to develop an alternative measure of religious composition using data obtained from the Demographic Health Survey (DHS).[9] The DHS survey, which is conducted at regular intervals across the world focuses mainly on health-related issues. Although women are often oversampled in the survey, a significant number of men are also included in the surveys. A benefit of working with the DHS dataset is that it often has very

[8] Broadly speaking, Nigeria has two major regions: The Northern and Southern Regions. These two regions were distinct protectorates of the British, until in 1914 when they were merged to form Nigeria. In 1939, the British carved out the Eastern and Western Regions from Southern Region. See Tuki (2024) for more details on this.

[9] To access the DHS dataset, visit: https://dhsprogram.com/data/available-datasets.cfm

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large sample sizes. Since the dataset is georeferenced, I pooled the survey data collected from 1990–2021 and matched the geolocations of the respondents with the LGA where they resided.[10] Because the DHS survey always asks respondents about their religious affiliation, I was able to compute the total number of Muslim and Christian respondents residing in the respective LGAs. Christianity and Islam are the two main religions practiced in Nigeria. Although there were a few respondents who belonged to neither of the two major religions, I treated them as missing observations, since this study is particularly concerned with Muslims and Christians. I computed the religious affiliations for a total of 208,000 respondents interviewed between 1990–2021. Similar to the case for religious infrastructure, I developed a dummy variable which I coded as 1 if there were more Muslim respondents in an LGA than Christians, and 0 if there were more Christian respondents than Muslims residing in the LGA.

The correlation between the dummy variables derived from the religious infrastructure and the DHS dataset was 0.85, which indicates that religious infrastructure is a good proxy for the religious composition of the population residing in the LGA. These two variables are underpinned by the assumption that settlement patterns in Nigeria have persisted over time. Integrating Afrobarometer survey data with the Georeferencing of Ethnic Groups (GREG) dataset (Weidmann et al. 2010), which is based on maps from the 1960s, Tuki (2024a, pp.14–15) shows that settlement patterns in Nigeria have largely remained consistent during the past six Nigeria.

Muslim affiliation. This is a dummy variable that takes the value of 1 if the respondent is Muslim and 0 if Christian. Of the 1,600 total observations in the Afrobarometer dataset, All the respondents were either Christian or Muslim, except for one who practiced traditional religion.

Control variables

I considered some control variables for exposure to violent conflict, the concrete experience of violence, and the respondents' demographic attributes. I discuss them below:

[10] Suffice it to add that the Demographic Health Survey (DHS) is conducted as a repeated cross-section.

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Conflict exposure. This variable measures the total number of violent conflict incidents within the 30km buffer around the respondents' dwellings that occurred between 1997 to 2016. I was able to develop this variable because I relied on data obtained from Afrobarometer (BenYishay et al. 2017) and the Armed Conflict Location and Events Database (ACLED) (Raleigh et al. 2010), both of which are georeferenced. Based on the ACLED dataset, I define a violent conflict as any incident that falls under any of the following three categories: Battles, Violence against civilians, and Explosions/Remote violence. Although the ACLED dataset is updated in real time, I excluded conflict incidents that occurred after 2016 while computing this variable to attenuate the problem of reverse causation. This is because the dependent variable is measured in 2017. The start year of 1997 was used because the ACELD dataset is available beginning from that year. I considered all the incidents within the buffer from 1997 to 2016 because I am particularly interested in the cumulative effect of violent conflicts.

Violence. This variable measures the concrete experience of violence by the respondents. It was derived from a question asking whether respondents had experienced violence in their neighborhood during the past two years. The responses were measured on an ordinal scale with the following responses: "0 = never," "1 = feared, but didn't experience," "2 = feared and experienced." Using the subsample of respondents who had never experienced violence as the reference category, I developed dummy variables for the remaining two response categories—*Violence (feared)* and *Violence (feared & experienced).*

Demographic covariates. This includes the age and gender of the respondents. Age measures how old the respondents are in years, while gender is measured using a dummy variable that takes the value of 1 if the respondent is male, and 0 if female.

Empirical strategy

Since this study examines the effect of Muslim affiliation and the predominance of Muslims in an area on concern about farmer-herder conflicts, the general form of the model could be expressed

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thus:

$$\gamma_t = \beta_0 + \beta_1 D'_t + \beta_2 \lambda'_t + e_t \quad (1)$$

Where γ_t is the dependent variable which measures the degree to which the respondents are concerned about farmer-herder conflicts at time t, D'_t is a vector of explanatory variables measuring Muslim affiliation and the predominance of Muslims in an area, λ'_t is a vector of control variables measuring exposure to violent conflict, the concrete experience of violence, and the respondents' demographic attributes, β_0 is the intercept, β_1 and β_2 are the coefficients of the explanatory and control variables respectively, while e_t is the error term.

My a priori expectation is that Muslim affiliation and the predominance of Muslims in an area would both have a negative effect on concern about farmer-herder conflicts. Reverse causation is unlikely to be a problem in the model because religious affiliation among Nigerians tends to remain stable over time. However, omitted variable bias might be a problem because I might not have controlled for some factors that could influence concern about farmer-herder conflicts in the regression model. To attenuate this problem, I estimated two-stage least squares (2SLS) regressions after conducting the correlational analysis.

I use emirate territory in precolonial Nigeria as an instrumental variable for Muslim affiliation and the predominance of Muslims in an area. The rationale behind the instrumental variable is that populations that were under emirate rule during the precolonial period were more likely to substitute their traditional religions for Islam. Moreover, the instrumental variable is underpinned by the assumption that settlement patterns have persisted over time in Nigeria. Some studies have shown that the legacies of the past tend to persist and shape the present (Cirone & Pepinsky 2022; Guiso et al. 2016; Nunn 2012). In present-day Nigeria, majority of the population in the states that overlap with the territory that was part of the Muslim emirate during the precolonial period is Muslim. Most of the emirate territory lies in Northern Nigeria. In fact, 12 of the 19 states in Northern Nigeria adopted shariah law in 2000, a move that polarized Christians and Muslims across the country and led to violent clashes between members of the two religious

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groups (Tuki 2022; Kendhammer 2013; Suberu 2009).

Before Northern Nigeria was captured by the British at the beginning of the 20th century, it had been a Muslim caliphate (i.e. Sokoto Caliphate) for a century. The caliphate consisted of several emirates that were governed by Islamic law (Kirk-Greene 1965, pp. 43-44). Prior to the establishment of the Sokoto Caliphate, most of Northern Nigeria was known as Hausaland and consisted mainly of people of Hausa ethnicity. The trans-Sahara trade between the Hausa people and merchants from the Maghreb states infused Islam into Northern Nigeria as early as the eleventh century. However, the religion was largely confined the courts of the Hausa rulers, while the larger population kept practicing their traditional religions (Falola & Heaton 2008, pp. 244–246; Harnischfeger 2006, pp. 40–41). Islam became deeply entrenched in Northern Nigeria when an Islamic cleric named Usman dan Fodio launched a jihad against the rulers of Hausaland in 1804 (Smith 1976, p. 48). The jihad was aimed at reviving the commitment to Islam among the Hausa rulers whom dan Fodio had accused of engaging in pagan practices, enslaving Muslims, and subverting justice. The successful jihad led to the dethronement of the Hausa rulers and the establishment of the Sokoto Caliphate—a state governed by Islamic law (Vaughan 2016, pp. 16–17; Van Beek 1988, pp. 157–158; Morel 1911, pp. 155–159).

After the capture of Hausaland, the jihadists, keen on further propagating Islam, pushed southwards, launching military campaigns against the pagan tribes in neighboring territories. The tribes residing in Nigeria's Middlebelt region—the area around the southernmost part of Northern Nigeria—were particularly vulnerable to these attacks because of their proximity to the Muslim emirates (Vaughan 2016, p. 17; Harnischfeger 2006, p. 41; Morel 1911, p. 99). The Muslim emirates depended on slaves to function. Since it was forbidden for Muslims to enslave fellow Muslims due to the brotherhood they shared under Islam, the jihadists frequently raided the pagan tribes whom they considered as "unbelievers" and enslaved them. The slaves were used as farm labor and for batter—i.e., in exchange for ammunition, horses, and other valuables (Van Beek 1988, pp. 163–

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166; Morel 1902, pp. 100–101). The spread of emirate influence was determined by exogenous factors like geography and the advent of British colonial rule.

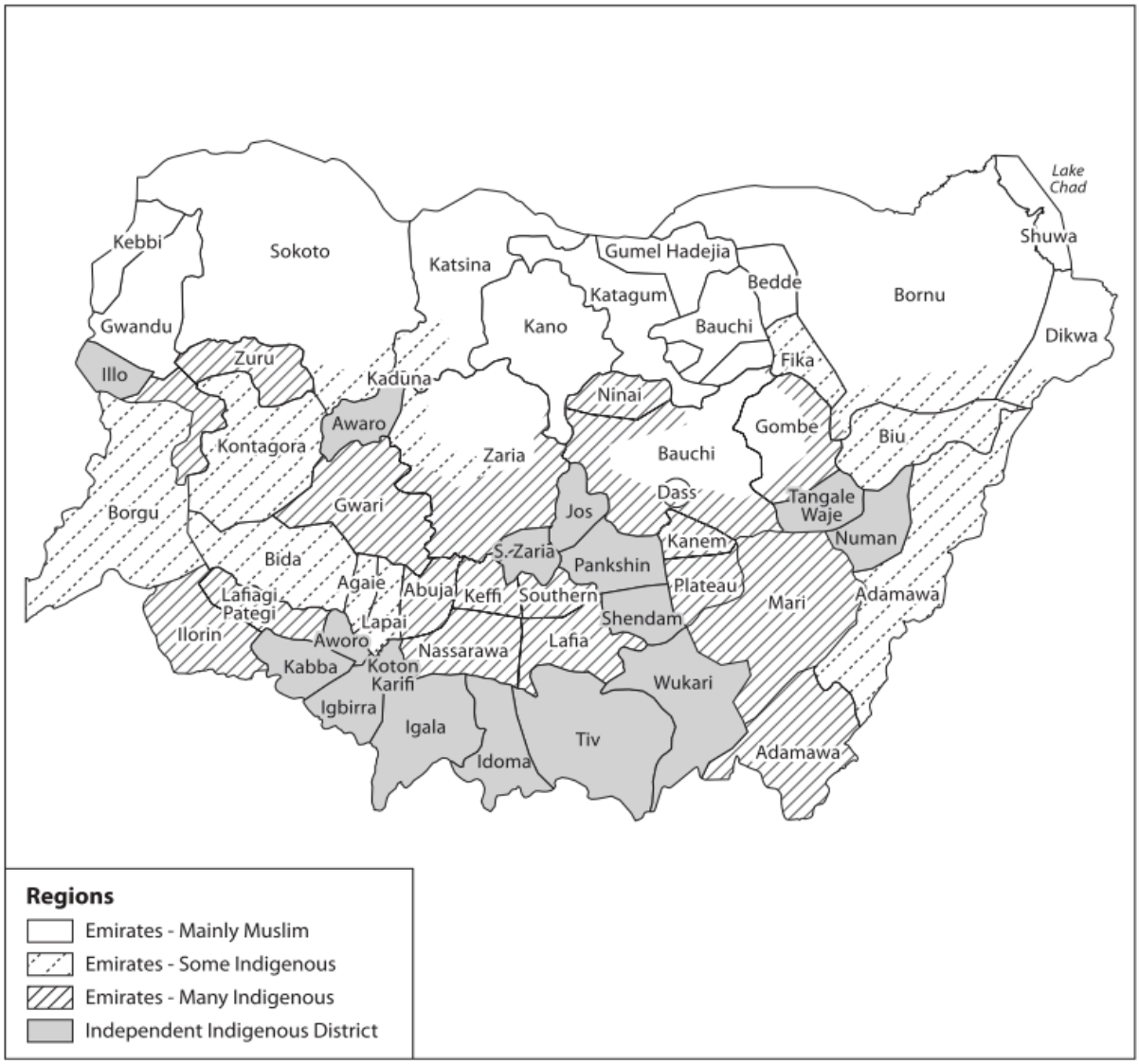

Figure 5: Islam and indigenous religions in the Northern Nigerian Protectorate, 1900–1940.

Note: The map shows the sphere of emirate influence in pre-colonial Northern Nigeria. The degree of emirate influence varied across the region. It was strongest in the areas labeled "Mainly Muslim" and weakest in those areas labelled "Indigenous districts." Source of precolonial map: Vaughan (2016).

The presence of tsetse flies and the dense tropical forests in Southern Nigeria made it inhospitable for the Muslim jihadists, thus curtailing the extent to which they could penetrate the Region (Coleman 1958, p. 39; Morel 1911, p. 99; Morel 1902, pp. 135).[11] Even within Northern Nigeria, some areas proved difficult for the jihadists to capture. For instance, the Jos Plateau, a highland nested between the Zaria and Bauchi Emirates, was never captured even though it was

[11] A large swathe of the land area in Southern Nigeria falls within the rainforest vegetation zone.

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attacked serval times. This was because of the strategic military advantage that the elevated highland provided, coupled with the skill that the tribes residing there possessed in warfare (Morrison 1982).

The advent of British colonialism also curtailed emirate expansion. In his 1903 speech at Sokoto after capturing Northern Nigeria, Lord Lugard, Nigeria's first Governor General, declared: "Buying and selling slaves and enslaving people are forbidden." (Kirk-Greene, 1965, p. 43). However, Morel (1902) questioned the morality of the British, especially because of the violent approach they had adopted towards ending the practice of slavery. He also established parallels between British colonial rule and the slavery system that they sought to abolish: "[H]ow often may not an expedition entered upon by a Mohammedan Emir against his pagan subjects in West Africa be as justifiable, if reckoned by the same standard, as the chastisement of a tribe by the representative of a European Power for resisting a tax enforced by that power, and considered by the tribe excessively unjust?" (p. 100).

The pagan tribes, who did not appreciate being enslaved by the jihadists, often fought back. Some of them migrated to the Jos plateau because it was safer there (Morrison 1982). Majority of these pagan tribes who had lived under the threat of jihadist incursions, but who were never captured, eventually embraced Christianity as a means of resisting Muslim dominance. Vaughan (2016, p. 5) observed that "conversion from indigenous religions to Christianity by missionary societies was far from a simple religious act; Christian conversion became a crucial medium of collective action against Hausa-Fulani Muslim rulers." Similarly, Campbell and Page (2018, p. 70) noted: "[M]inority tribes prepared to move from, or add to, their traditional religion have found Christianity more attractive than Islam, especially in the north and the Middle Belt." The areas labelled as "Independent indigenous districts" in figure 5 are the uncaptured territories. These areas fall largely within the Middlebelt region. Most of the population in the uncaptured territories remains Christian today. To better demonstrate this historical persistence, I georeferenced the picture of the precolonial map using QGIS software and rendered the geolocations of the religious infrastructure over it. I deliberately put the layer containing mosques above that containing

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churches so the areas where churches are clustered could be better identified.

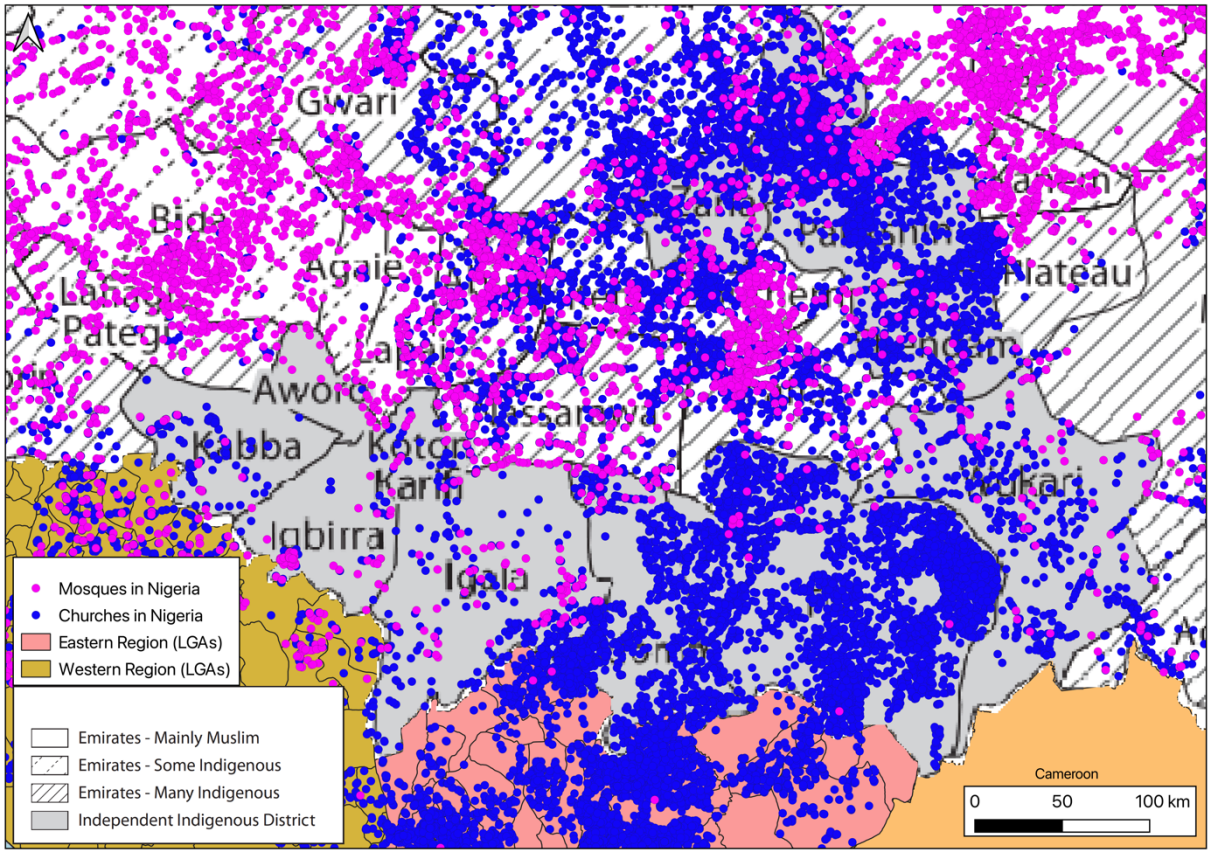

Figure 6: Concentration of mosques and churches in uncaptured territory

Note: The figure zooms in on the independent indigenous district in Nigeria's Middlebelt Region that was not under emirate rule during the precolonial period and shows the geolocations of the churches and mosques there.

As shown in Figure 6, majority of the religious infrastructure in the uncaptured territory are churches, which suggests that the population residing there is predominantly Christian. The figure also shows that mosques are concentrated in the areas that were under emirate control in precolonial Nigeria. Such cultural persistence justifies my decision to use emirate territory as an instrumental variable for Muslim affiliation and the predominance of Muslims in an area. This also lends support to my earlier argument that settlement patterns have persisted over time in Nigeria. Campbell and Page (2018, p. 78) observed that "there is significant social and religious continuity between modern northern Nigeria and the two Muslim kingdoms, the Sultanate of Sokoto and the Kingdom of Bornu." The instrumental variable regressions are hence underpinned by the assumption that emirate territory influences concern about farmer-herder conflicts only through the mechanisms of the predominance of Muslims in an area and Muslim affiliation. The plausibility

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of this relationship is further strengthened by the fact that violent farmer-herder conflicts are quite a recent phenomenon in Nigeria, as had been discussed in the introduction. Below, I discuss the steps taken to develop the instrumental variable measuring emirate territory. .

Emirate territory. The instrumental variable—*Emirate territory*—is a dummy that takes the value of 1 if at least half of the spatial area that constitutes a local government area (LGA) overlaps with an area that was under emirate control in precolonial Nigeria. Relying on the precolonial map of Northern Nigeria, I define emirate territory as any area under the following three categories: "Emirates—Mainly Muslim", "Emirates—Some indigenous", and "Emirates—Many indigenous." I coded the remaining LGAs—i.e. those where at least half of their spatial area overlapped with the "Independent indigenous district" as well as the LGAs situated in Southern Nigeria—as 0.

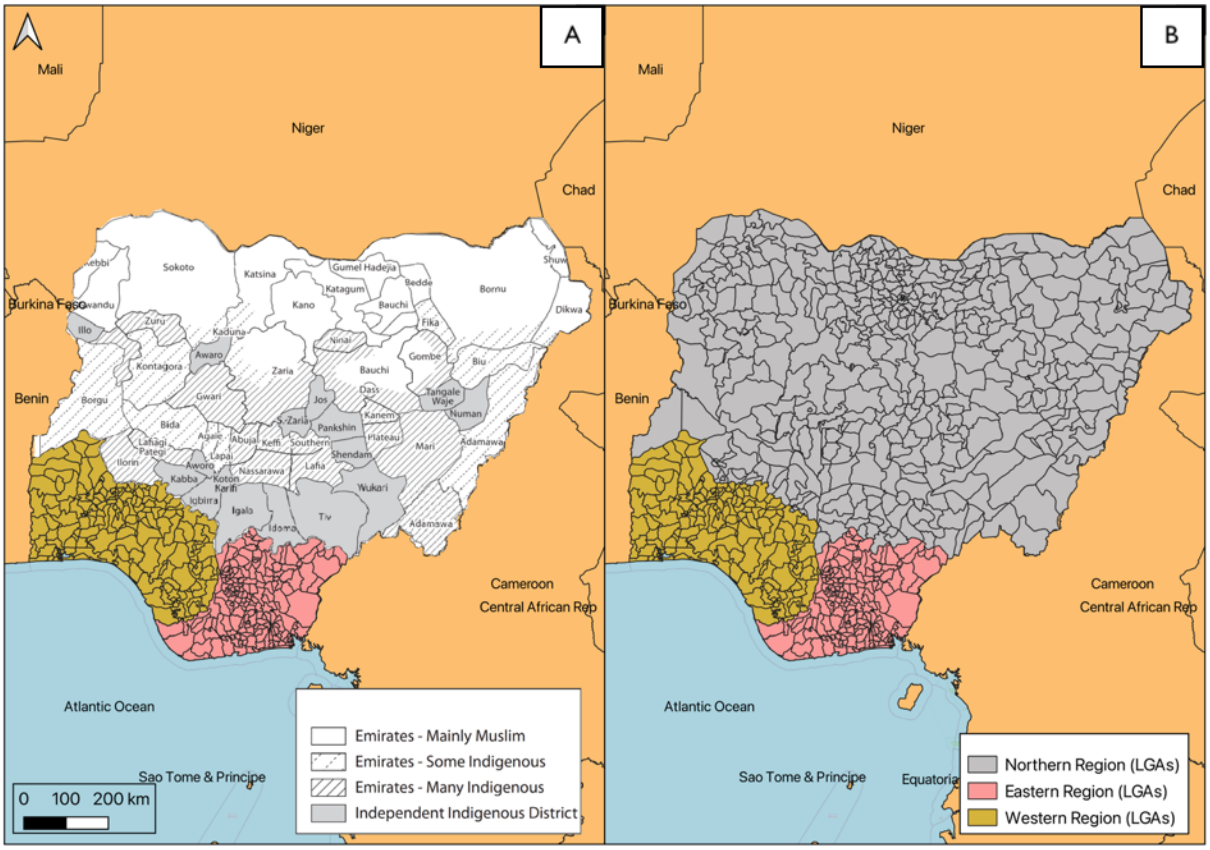

Figure 7: Developing a measure for emirate territory.

Note: Panel A shows Nigeria's precolonial map and the local government areas (LGAs) that constitute Nigeria's Eastern and Western Regions. Panel B shows the LGA administrative boundaries in Nigeria's three major regions. The Eastern and Western Regions are usually referred to as Southern Nigeria.

Using QGIS software, I placed a shape file containing Nigeria's LGA administrative boundaries over the georeferenced precolonial map. Having made the layer containing the LGA

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administrative boundaries opaque, I was able to highlight all the LGAs that overlapped sufficiently with emirate territory. Because the LGAs are quite small, they fitted snugly the respective spatial categories of the precolonial map. See Figure 7 for a visualization.

4. Results and discussion

Correlational analysis

Table 1: Correlates between religion and concern about farmer-herder conflicts

Concern F-H conflict$^{\Phi}$	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Dominant Muslim (infrastructure)	-0.117**	-0.11**				
	(0.052)	(0.053)				
Dominant Muslim (DHS)			-0.141***	-0.136***		
			(0.05)	(0.051)		
Muslim affiliation					-0.156***	-0.134***
					(0.049)	(0.049)
Violence (feared)		0.099*		0.086		0.08
		(0.06)		(0.058)		(0.057)
Violence (feared & experienced)		0.177***		0.149**		0.138**
		(0.064)		(0.062)		(0.062)
Conflict exposure		0.00		0.00		0.00
		(0.00)		(0.00)		(0.00)
Age		0.005**		0.005***		0.005***
		(0.002)		(0.002)		(0.002)
Gender		-0.132***		-0.128***		-0.12**
		(0.051)		(0.048)		(0.048)
Constant	3.452***	3.322***	3.469***	3.345***	3.48***	3.349***
	(0.031)	(0.078)	(0.029)	(0.075)	(0.03)	(0.074)
Observations	1058	1055	1158	1155	1166	1163
R-squared	0.005	0.022	0.007	0.023	0.009	0.023
AIC statistic	2571.229	2557.052	2818.564	2804.135	2831.036	2818.96

Note: Robust standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable which is measured on a scale with four ordinal categories. All models are estimated using ordinary least squares (OLS) regressions.

Table 1 presents the results of regression models examining the correlation between Muslim dominance/affiliation and concern about farmer-herder conflicts. I added the variables into the model in a stepwise manner to mitigate the problem of multicollinearity. This also prevents a scenario whereby the results are dependent on the inclusion of a particular combination of variables. Models 1 to 4 focus on the predominance of Muslims in an area, while models 5 and 6 focus on Muslim affiliation. I did not include Muslim affiliation and the predominance of Muslims in an area in the same model because the correlation between them was 0.6.

Model 1 is a baseline model where I considered only the variable measuring the predominance of Muslims in an area derived from religious infrastructure. It carried the expected

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negative sign and was significant at the five percent level, which supports Hypothesis 1 that individuals residing in LGAs where with a predominantly Muslim population would be less concerned about farmer-herder conflicts than those residing in LGAs with a predominantly Christian population. Model 2 shows that these results are robust to the inclusion of control variables. Among the control variables, only exposure to conflict was statistically insignificant. The positive sign accompanying the violence related variables suggest that people who have either feared violence or both feared and experienced violence are more likely to be concerned about farmer-herder conflicts than those who have not neither feared nor experienced any form of violence. The positive sign accompanying age implies that older people are more likely to be concerned about farmer-herder conflicts. Moreover, the negative sign accompanying gender indicates that compared to women, men are less worried about farmer-herder conflicts.

In models 3 and 4 where I rather measured the predominance of Muslims in an area using the variable derived from the DHS, the results were largely consistent with those reported in models 1 and 2. Model 5 is a baseline model where I considered only Muslim affiliation. It carried the expected negative sign and was significant at the one percent level, which supports Hypothesis 2 that Muslims are less worried about farmer-herder conflicts than Christians. In model 6 where I added the control variables, Muslim affiliation remained significant at the one percent level and retained its negative sign. Suffice it to add that the regression results reported in Table 1 are robust to a binary operationalization of the dependent variable (see Table A2 in the appendix).

Instrumental variable regressions

First-stage regressions

Table 2 reports the results of the first-stage regressions examining the association between emirate territory and Muslim dominance/affiliation. Because the dependent variables are measured binarily, the coefficients can be interpreted as probabilities. Model 1 shows that that the probability that an LGA that was part of emirate territory would have a predominantly Muslim population today (i.e., based on religious infrastructure) is 70 percent. In model 2 where I rather measured the

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predominance of Muslims using the DHS variable, the probability increased by five percentage points. Like the previous two models, model 3 shows that emirate territory is also positively correlated with Muslim affiliation.

Table 2: Correlation between emirate territory, Muslim affiliation, and the predominance of Muslims in an area

	(1) Dominant Muslim (Infrastructure) $^{\Phi}$	(2) Dominant Muslim (DHS) $^{\Phi}$	(3) Muslim affiliation$^{\Phi}$
Emirate territory	0.7***	0.75***	0.537***
	(0.021)	(0.019)	(0.024)
Constant	0.136***	0.138***	0.174***
	(0.013)	(0.012)	(0.014)
Observations	1195	1303	1319
R-squared	0.487	0.549	0.292
AIC statistic	919.67	837.652	1400.376

Note: Robust standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable. The three dependent variables are measured binarily. All models are estimated using linear probability model (LPM).

Second-stage regressions

Table 3 reports the results of the second-stage regression models examining the effect of Muslim dominance/affiliation on concern about farmer-herder conflicts. Models 1 to 4 focus on the predominance of Muslim in an area, while models 5 and 6 focus on Muslim affiliation. I included fixed effects for the ethnicity of the respondents in all the models so I could better isolate the effect of religion on concern about farmer-herder conflicts. This was necessary because religion and ethnicity overlap to a great extent in Nigeria. In models 1 and 2, the measure for the predominance of Muslims in an area derived from religious infrastructure was significant at the five percent level and carried the expected negative sign. This provides further support for Hypothesis 1. In models 3 and 4 where I rather measured Muslim predominance using the variable derived from DHS, it was also statistically significant at the five percent level and carried the expected negative sign. In models 5 and 6 where the models focused on Muslim affiliation, it carried the expected negative sign and was significant at the five percent level, which provides further support for Hypothesis 2. The Durbin and Wu-Hausman statistics were significant in all the regression models, which indicates that endogeneity was indeed present and the use of an instrumental variable approach to estimate the models was appropriate. Suffice it to add that the results reported in Table 3 are robust to a binary operationalization of the dependent variable (see Table A3 in the appendix).

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Table 3: Effect of Muslim affiliation and the predominance of Muslims in an area on concern about farmer-herder conflicts

Concern F-H conflict$^{\Phi}$	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Dominant Muslim (infrastructure)	-0.521**	-0.536**				
	(0.231)	(0.239)				
Dominant Muslim (DHS)			-0.59**	-0.609**		
			(0.239)	(0.243)		
Muslim affiliation					-0.846**	-0.86**
					(0.356)	(0.359)
Violence (feared)		0.116*		0.102*		0.091
		(0.062)		(0.061)		(0.062)
Violence (feared & experienced)		0.178**		0.155**		0.084
		(0.07)		(0.067)		(0.073)
Conflict exposure		0.00		0.00		0.00
		(0.0)		(0.00)		(0.00)
Age		0.005***		0.005***		0.005**
		(0.002)		(0.002)		(0.002)
Gender		-0.127**		-0.118**		-0.084*
		(0.05)		(0.048)		(0.051)
Constant	3.711***	3.586***	3.769***	3.662***	4.012***	3.896***
	(0.222)	(0.229)	(0.236)	(0.241)	(0.346)	(0.345)
Ethnic group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1058	1055	1158	1155	1166	1163
R-squared	0.029	0.048	0.019	0.036	-	-
Durbin statistic	4.498**	3.886**	6.131**	5.69**	4.323**	4.66**
Wu-Hausman statistic	4.394**	3.774*	6.009**	5.55**	4.238**	4.541**
F statistic (first-stage)	171.996***	161.492***	162.449***	155.793***	53.945***	53.038***

Note: Robust standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable which is measured on a scale with four ordinal categories. All models are estimated using two-stage least squares (2SLS) regression.

Mechanism

In section 2, I had asserted that trust was a plausible mechanism through which religion could influence concern about farmer-herder conflicts. More specifically, I had argued that the common religion of Islam shared by nomadic Fulani herders and the Muslim sedentary population increased the likelihood of trust being established between members of both groups, which lowered the likelihood of disputes over land and water resources turning violent. To test this mechanism, I relied upon novel survey data collected in Nigeria as part of the Transnational Perspectives on Migration and Integration (TRANSMIT) research project in 2021.[12] Data were collected from the states of Kaduna and Edo, which are in Nigeria's Northern and Southern Regions respectively. Pooling the data from both states (regions) allows me to roughly approximate the Nigerian

[12] For more information on the TRANSMIT project, visit: https://www.projekte.hu-berlin.de/en/transmit

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population. 1,353 and 1,638 respondents were interviewed in Kaduna and Edo respectively.[13] Section B in the appendix describes the sampling strategy in detail.

The survey instrument had a question where respondents were asked about the extent to which they trust members of the Fulani ethnic group. The responses were measured on a scale with five ordinal categories ranging from "do not trust at all" to "trust completely." Because herders belong to the Fulani ethnic group, this has led to a contagion effect where the actions of a few Fulani herders have shaped how members of larger ethnic group is perceived, even though not all Fulani engage in nomadic pastoralism (Tuki 2023). The TRANSMIT survey instrument contained an open question where respondents were asked what the main cause of farmer-herder conflicts was. An examination of the responses showed that most respondents had said farmer-conflicts were caused by cattle straying into farmlands and destroying crops, which invariably ascribes blame to nomadic herders. This is likely because land is immobile and the herders' livestock are not.

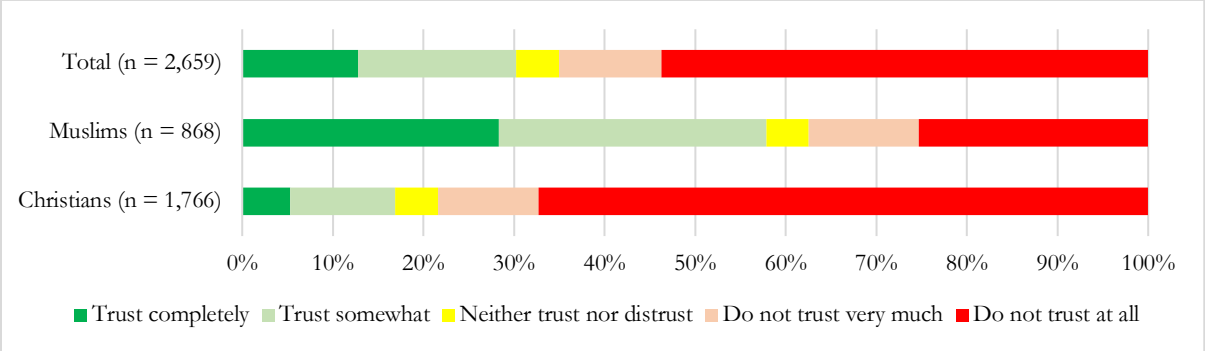

Figure 8: Distrust in members of the Fulani ethnic group

Note: The figure shows the degree to which respondents trust members of the Fulani ethnic group. The y-axis shows the total number of respondents from the states of Edo and Kaduna and the breakdown of the respondents based on their religious affiliation (i.e., Christians and Muslims). The x-axis shows the percentage of respondents associated with the various response categories.

As shown in Figure 8, 30 percent of the population trust members of the Fulani ethnic group either "somewhat" or "completely."[14] However, disaggregating the based on religious affiliation shows that Muslims have more trust in the Fulani than Christians: While 58 percent of

[13] The state of Edo has a predominantly Christian population, with a small Muslim minority. In the sample from Edo, Christians and Muslims were represented in the ratio 89:11. In the state of Kaduna, Muslims are slightly more numerous than Christians, with each group represented in the ratio 56:44.
[14] I treated the 35 respondents who refused to answer the question as missing observations.

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Muslims either trust the Fulani "somewhat" or "completely," the estimate for Christians is only 17 percent.[15] These descriptive results lend support to my argument that a shared religion fosters trust and reduces the likelihood of disputes over land and water resources turning violent. This is congruent with the argument put forth by Eke (2020) that the subjective perceptions of sedentary communities toward nomadic Fulani herders are crucial in gaining a holistic understanding of the conditions under which famer-herder conflicts occur. Moreover, farmer-herder conflicts tend to erupt along ethnoreligious lines (Tuki 2023).

Table 4: Regressing trust in members of the Fulani ethnic group against religious affiliation

Trust in Fulani$^{\Phi}$	**(1)**
Muslim affiliation	1.469***
	(0.062)
Constant	0.764***
	(0.03)
Observations	2634
R-squared	0.201
AIC statistic	9172.205

Note: Robust standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable, which is measured on a scale with five ordinal categories. The model is estimated using ordinary least squares (OLS) regression

Moving beyond the simple descriptive results, I estimated a bivariate model where I regressed trust in members of the Fulani ethnic group on Muslim affiliation. As shown in Table 4, Muslim affiliation was significant at the one percent level and carried the expected positive sign, which shows that Muslims are more likely to trust members of the Fulani ethnic group than Christians.

The Afrobarometer survey instrument had questions regarding the respondents' perception of the intensity of farmer-herder conflicts and their assessment of the Nigerian government's effort at resolving intercommunal conflicts in the country. In the first question, respondents were asked, "In your opinion, would you say the conflict between farmers and herdsmen has increased, decreased or stayed the same over the past year?" The responses were measured on a scale with five ordinal categories ranging from "0 = increased a lot" to "4 =

[15] Although there were 25 respondents who were neither Christians nor Muslims, I treated them as missing observations because I am particularly interested in members of the two major religious groups. This led to a marginal decrease in the number of observations.

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decreased a lot." In the second question, they were asked, "How well or badly would you say the current government is handling the following matters, or haven't you heard enough to say? Preventing or resolving violent conflict between communities." The responses were measured on a scale with four ordinal categories ranging from "1 = very badly" to "4 = very well."

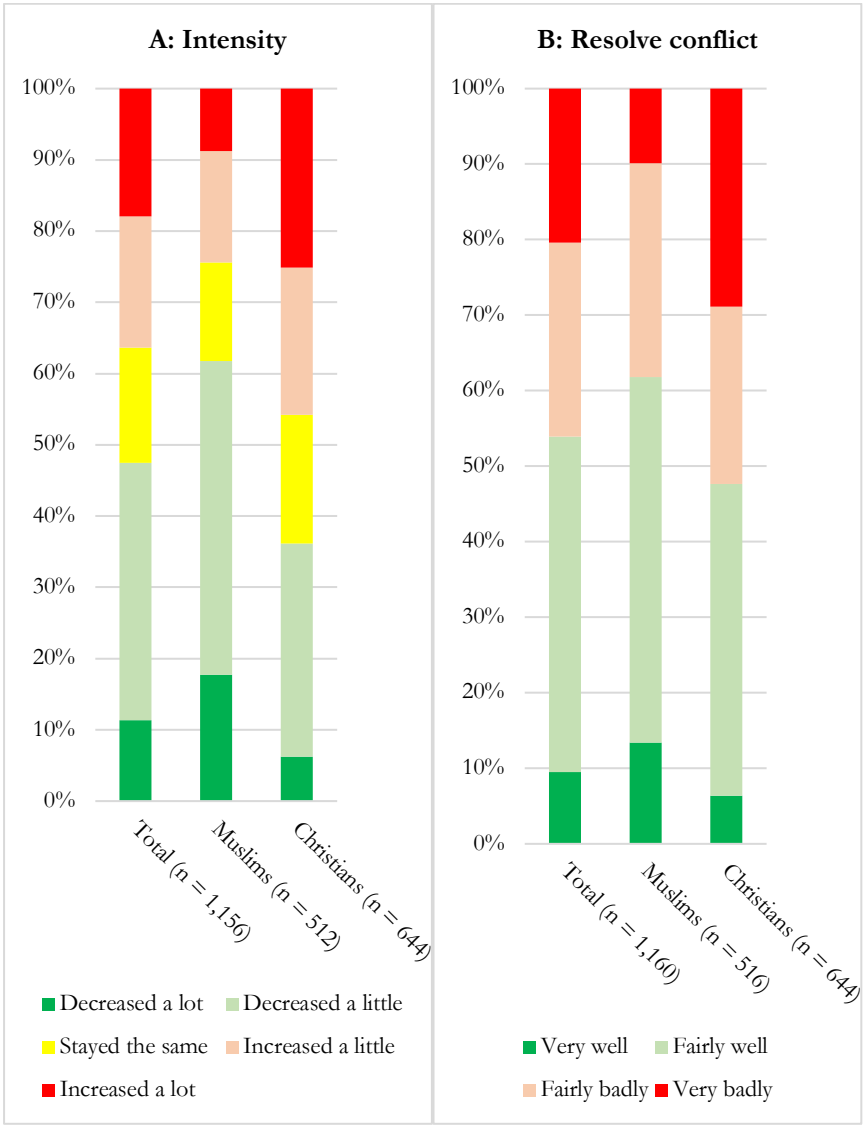

Figure 9: Religious affiliation, conflict intensity, and government resolution of conflict

Note: Panel A in shows the religious distribution of respondents' responses to a question where respondents were asked whether farmer-herder conflicts had increased, decreased, or stayed the same during the past year. Panel B shows the religious distribution of responses to a question where respondents were asked to assess the Nigerian government's effort at resolving intercommunal conflicts in the country. The y-axis in both panels show the percentage of respondents associated with the various response categories, while the x-axis shows the total number of respondents asked the relevant questions as well as the religious subsamples (i.e., Christians and Muslims).

Figure 9 plots the responses to these two questions on a stacked bar chart. A cursory look at the figure reveals that Christians are more likely than Muslims to think that farmer-herder

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conflicts have increased. Moreover, Christians are more skeptical about the Nigerian government's effectiveness at resolving intercommunal conflicts than Muslims. While 46 percent of Christians think farmer-herder conflicts have either "increased a little" or "increased a lot," the estimate for Muslims is 24 percent. While 52 percent of Christians think the Nigerian government has performed "fairly badly" or "very badly" at resolving intercommunal conflicts in the country, the estimate for Muslims is 38 percent. The tendency among Muslims to perceive farmer-herder conflicts as being less intense compared to Christians, coupled with their better assessment of the Nigerian government's effort at resolving intercommunal conflicts might also partly explain why they are less concerned about farmer-herder conflicts.

Table 5: Regressing conflict intensity and government effectiveness on religion

	F-H conflict decreased$^{\Phi}$			**Gov't resolve conflict$^{\Phi}$**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Dominant Muslim (infrastructure)	0.758***			0.421***		
	(0.079)			(0.055)		
Dominant Muslim (DHS)		0.726***			0.39***	
		(0.075)			(0.053)	
Muslim affiliation			0.749***			0.402***
			(0.074)			(0.052)
Constant	1.703***	1.739***	1.714***	2.27***	2.271***	2.252***
	(0.051)	(0.049)	(0.051)	(0.038)	(0.036)	(0.037)
Observations	1048	1148	1156	1052	1152	1160
R-squared	0.081	0.075	0.081	0.051	0.044	0.047
AIC statistics	3462.762	3792.184	3809.72	2758.291	3029.54	3042.271

Note: Robust standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable. All models are estimated using ordinary least squares (OLS) regression.

Moving beyond the simple descriptive analysis, I estimated some bivariate regression models where I regressed these two items against Muslim affiliation and the predominance of Muslims in an area. Table 5 reports the regression results. Congruent with the findings from the descriptive analysis, models 1 to 3 show that the predominance of Muslims in an area and Muslim affiliation are positively correlated with the perception that the intensity of farmer-herder conflicts had decreased. Put differently, an individual residing in an LGA with a predominantly Muslim population is more likely to agree that farmer-herder conflicts have decreased compared to an individual residing in an LGA with a predominantly Christian population. Moreover, Muslims are more likely to think farmer-herder conflicts have decreased compared to Christians. The positive

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sign accompanying the predominance of Muslims in an area and Muslim affiliation in models 4 to 6 suggest that individuals residing in LGAs with a predominantly Muslim population are more likely to assess the Nigerian government's effort at resolving intercommunal conflicts favorably than individuals residing in LGAs with a predominantly Christian population. Furthermore, Muslims are more likely to assess the Nigerian government's conflict resolution efforts more favorably than Christians.

5. Conclusion

This study examined the effect of Muslim affiliation and the predominance of Muslims in an area on concern about farmer-herder conflicts in Nigeria. The regression results showed that individuals residing in local government areas (LGAs) (i.e., municipalities) with a predominantly Muslim population are less likely to be concerned about farmer-herder conflicts than individuals residing in LGAs with a predominantly Christian population. Moreover, Muslims were found to be less concerned about farmer-herder conflicts than Christians. A plausible mechanism underlying these results, which I was able to show with the data, is that the common religion of Islam shared by the Muslim sedentary population and nomadic Fulani herders allows for trust to be easily established more easily between members of the two groups, which in turn lowers the likelihood of disputes over land and water resources turning violent. The lower incidence of violence in turn leads to a lower concern about farmer-herder conflicts. Compared to Christians, Muslims were more likely to think that the incidence of farmer-herder conflicts in Nigeria had decreased. Moreover, Muslims were more likely to assess the Nigerian government's effort at resolving intercommunal conflicts in the country favorably than their Christian counterparts.

These results highlight the need for religion to be considered in the analysis of farmer-herder conflicts in Nigeria. Its neglect prevents a holistic examination of the conflict and conceals some potentially insightful mechanisms that might be crucial in understanding why these conflicts occur frequently in some places but not in others. The results also highlight the need for policymakers to direct more effort towards fostering inter-religious and inter-ethnic trust among

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the Nigerian population. Once trust is established, it then becomes easier for disputes over land and water resources to be resolved amicably. Given Nigeria's unique cultural landscape, the results of this study might not be applicable to other countries experiencing farmer-herder conflicts. Nevertheless, this highlights the need for the local context within conflicts occur to be considered in their analysis.

Conflict of interest

None

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Appendix

Section A

Table A1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Concern F-H conflict	1166	3.411	0.817	1	4
Concern F-H conflict (binary)	1166	0.88	0.325	0	1
Dominant Muslim (infrastructure)	1195	0.435	0.496	0	1
Dominant Muslim (DHS)	1303	0.44	0.497	0	1
Muslim affiliation	1319	0.393	0.489	0	1
Emirate territory	1319	0.407	0.491	0	1
Violence (feared)	1165	0.23	0.421	0	1
Violence (feared & experienced)	1165	0.19	0.392	0	1
Conflict exposure	1311	63.579	104.267	0	475
F-H conflict decreased	1156	2.046	1.309	0	4
Government resolve conflict	1160	2.43	0.919	1	4
Age	1166	33.214	12.761	18	80
Gender	1167	0.534	0.499	0	1
Trust in Fulani$^{\sigma}$	2659	1.242	1.541	0	4
Muslim affiliation$^{\sigma}$	2804	0.319	0.466	0	1

Note: All statistics are associated with the Afrobarometer survey dataset, except for those with the symbol σ, which are based on the Transnational Perspectives on Migration and Integration (TRANSMIT) survey dataset.

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Table A2: Replicating the results in Table 1 using a binary dependent variable (i.e., correlations)

Concern F-H conflict (binary)$^{\Phi}$	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Dominant Muslim (infrastructure)	-0.055***	-0.039*				
	(0.021)	(0.021)				
Dominant Muslim (DHS)			-0.07***	-0.058***		
			(0.02)	(0.021)		
Muslim affiliation					-0.051***	-0.035*
					(0.02)	(0.02)
Violence (feared)		0.067***		0.064***		0.064***
		(0.023)		(0.022)		(0.022)
Violence (feared & experienced)		0.064**		0.054**		0.054**
		(0.026)		(0.025)		(0.025)
Conflict exposure		0.00*		0.00		0.00*
		(0.00)		(0.00)		(0.00)
Age		0.001		0.001		0.001
		(0.001)		(0.001)		(0.001)
Gender		-0.034*		-0.035*		-0.034*
		(0.021)		(0.019)		(0.02)
Constant	0.903***	0.846***	0.908***	0.86***	0.903***	0.853***
	(0.012)	(0.031)	(0.011)	(0.029)	(0.012)	(0.029)
Observations	1058	1055	1158	1155	1166	1163
R-squared	0.007	0.021	0.011	0.023	0.006	0.018
AIC statistic	620.97	616.899	681.331	678.104	685.031	681.505

Note: Robust standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. **Φ** is the dependent variable which is measured binarily. All regressions are estimated using linear probability model (LPM).

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Table A3: Replicating the results in Table 3 using a binary dependent variable (i.e., second-stage regressions)

Concern F-H conflict (binary)$^{\Phi}$	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Dominant Muslim (infrastructure)	-0.288***	-0.269***				
	(0.093)	(0.096)				
Dominant Muslim (DHS)			-0.312***	-0.296***		
			(0.096)	(0.098)		
Muslim affiliation					-0.421***	-0.39***
					(0.148)	(0.148)
Violence (feared)		0.075***		0.072***		0.066***
		(0.025)		(0.024)		(0.025)
Violence (feared & experienced)		0.067**		0.059**		0.025
		(0.028)		(0.027)		(0.03)
Conflict exposure		0.00		0.00		0.00
		(0.00)		(0.00)		(0.00)
Age		0.001		0.001		0.001
		(0.001)		(0.001)		(0.001)
Gender		-0.029		-0.029		-0.016
		(0.02)		(0.019)		(0.021)
Constant	1.073***	1.007***	1.09***	1.037***	1.194***	1.127***
	(0.09)	(0.092)	(0.095)	(0.097)	(0.144)	(0.142)
Ethnic group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1058	1055	1158	1155	1166	1163
R-squared	0.003	0.025	0.00	0.019	.	.
Durbin statistic	9.093***	7.264***	9.433***	7.901***	9.487***	8.151***
Wu-Hausman statistic	8.921***	7.079***	9.273***	7.721***	9.326***	7.969***
F statistic (first-stage)	171.996***	161.492***	162.449***	155.793***	53.945***	53.038***

Note: Robust standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. **Φ** is the dependent variable which is measured binarily. All models are estimated using two-stage least squares (2SLS) regression.

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Table A4: Annual trend of conflict involving herders (1997–2023).

Year	Frequency	Percent	Cumulative
1997	1	0.04	0.04
1998	2	0.08	0.12
1999	8	0.31	0.42
2000	4	0.15	0.58
2001	4	0.15	0.73
2002	7	0.27	1.00
2003	6	0.23	1.23
2004	12	0.46	1.69
2005	4	0.15	1.85
2007	1	0.04	1.88
2008	3	0.12	2.00
2009	3	0.12	2.12
2010	33	1.27	3.38
2011	17	0.65	4.04
2012	32	1.23	5.27
2013	99	3.81	9.08
2014	138	5.31	14.38
2015	84	3.23	17.62
2016	93	3.58	21.19
2017	125	4.81	26.00
2018	452	17.38	43.38
2019	272	10.46	53.85
2020	321	12.35	66.19
2021	327	12.58	78.77
2022	274	10.54	89.31
2023	278	10.69	100.00
Total	**2,600**	**100.00**	

Note: Based on data from ACLED (Raleigh et al. 2010). The table shows the trend of conflict incidents in which at least one of the actors was a herder.

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Section B

Sampling strategy for the TRANSMIT dataset:

As part of the Transnational Perspectives on Migration and Integration (TRANSMIT) research project, the WZB Berlin Social Science Center, Berlin, Germany, conducted a survey in the states of Edo and Kaduna in 2021, which are in Nigeria's Southern and Northern regions respectively. 1,353 and 1,638 respondents were interviewed in Kaduna and Edo respectively. Respondents were at least 15 years old. To select the interview locations, multi-stage clustered random sampling was employed. Although the sampling strategy employed in both states was similar, it was not identical. This is because all the local government areas (LGAs) in Edo were accessible to enumerators to conduct interviews in, but four LGAs in Kaduna (i.e., Giwa, Birnin Gwari, Kauru, and Zangon Kataf) were unsafe areas for interviews due to the high risk of intercommunal conflict. These four LGAs were excluded from the sampling frame.

Grid cells of 5 x 5km, which were called precincts, were developed using QGIS software. These precincts were laid on a shapefile showing the administrative boundaries of both states. Each precinct was comprised of smaller 0.5 x 0.5km grid cells. Precincts were randomly drawn with replacement, with probabilities corresponding to the population sizes within each of them. From each of the selected precincts, smaller 0.5 x 0.5km grid cells were randomly selected with probabilities corresponding to the size of the population within them. The smaller grid cells were drawn without replacement. Within each of the smaller grid cells, an average of 12 households were interviewed. The households were selected using a random walk approach, and the interviewee within the household was chosen using a simple random draw. Respondents were at least 15 years old. Before minors were interviewed, consent was sought from the household head. The minor was interviewed only if he or she also granted consent. Respondents were informed that participation in the survey was voluntary, and they could opt out of the interview at any time.

The slight difference between the sampling strategy employed in Kaduna compared to the one used in Edo is that the sample in Kaduna was stratified according to the population size in the

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senatorial district (Each state in Nigeria comprises of 3 senatorial districts; each senatorial district comprises of LGAs). This was done to ensure that the exclusion of the four LGAs did not skew the sample. Samples were drawn within each of the senatorial districts in relation to their respective population shares. It is difficult to obtain recent population estimates for Nigeria from official government sources because the last population census was conducted in 2006. Due to this constraint, the population for both states were obtained from the 2020 Worldpop gridded dataset (Bondarenko et al. 2020).

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