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Identity, Political Ecology, and Human Security:
A Study of Climate-Induced Intra-Ethnic
Conflict among the Fulani in the Sahel Region of Nigeria

A Thesis in Anthropology

by

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Abstract

The recent climate changes occurring globally are having extreme implications on livelihoods and human security in sub-Saharan Africa. In Nigeria, the Fulani are facing increased tensions stemming from changes in resource availability due to competition and deviations from traditional movements to cope with these changes. The Fulani's fluid ethnic identities have historically maintained cohesion among pastoralists and horticulturalists. As the Fulani are forced to compete for resources among different subsistence practices, intra-ethnic tensions and violent conflicts have increased, threatening the security and stability of the Nigerian state. The negative implications of the complex connection between climate change and conflict are explained through indirect causal factors. These indirect causal factors include climate-induced resource reductions which impact social interactions between people, the current political ecology of Nigeria, the complex interactions between identity and social structure, the failure of traditional and modern institutions to prevent conflict caused by the inequalities and differences reflected within the plural composition of Nigeria, and the related feelings of disenchantment and anomie among the Fulani. These negative implications of climate change all contribute to a reduction in human security which has been shown to contribute to greater occurrences of violent conflict that are now more deadly than that of Boko Haram. The causal influences that are discussed provide insight into this human security issue with regard to the Western and British colonial influence on the conflict and its framing, showing a holistic representation of the conflict and its surrounding discourse.

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Chapter I

Introduction

The West African Sahel is an area of ethnic and religious pluralism, climate variability, and varying livelihoods that have been formed through years of continuously changing identities. The progression from pre-colonial populations to colonialism, and finally the independence of states, in combination with the fluid identities, has created the current political ecology. The environmental zone of the Sahel itself is a continuous zone that transverses Africa latitudinally from Senegal in the west to Sudan and Eritrea in the east (Hopen 1958). The West African Sahel spans only a portion of this region, covering over two thousand miles from Senegal in the west to Chad in the east, with the northern boundary being the Sahara desert (Hopen 1958). This region has seen numerous changes in political, social, and cultural structure throughout its history. Pre-colonial West Africa from the mid-eighteenth century to the mid-nineteenth century was a cosmopolitan area characterized by the continuous influx of people and ideas as migration took place throughout the continent (Getz 2013). Not all groups maintained an enforced power structure during this time, but if necessary rules could be implemented to maintain balance among the community (Getz 2013). Even with the existence of these rules, exceptions were commonplace among the ethnically and religiously fluid groups (Getz 2013). Their fluidity and continual movement within such a large expanse of land did not require the need for strict divisions or structures (Getz 2013). Instead, the nature of the ethnic groups tended to limit major sources of conflict. Traditional institutions of

reciprocity were employed as a way to maintain cohesion (Benjaminsen et al. 2008). The vastly diverse peoples were able to maintain stability while continuing practices such as exogamy, trade, and movement for livelihoods through largely decentralized methods (Getz 2013). All of these systems relied on relationships with others outside of the immediate community, strengthening relations with other segments of the group.

Among the diverse groups present in the early West African Sahelian region were the pre-colonial Fulani, one of the major ethnic groups residing in present-day Nigeria. Pre-colonial Fulani were identified by their practice of fight or flight, either fighting to defend their cattle or fleeing to protect the cattle from enemies, resulting in different relations with various peoples of both the same and different ethnic groups (Hopen 1958). Their location within Nigeria sheltered the population from major external influences during the pre-colonial period. There were only minor influences from the West and Asia, in part due to the slave trade and trade in general, as these influences tended to have the greatest impact on coastal areas with the ideas radiating into the interior of the region (Getz 2013). Colonialism began in the mid-nineteenth century, gradually expanding during the latter half of the century with the occurrence of the Berlin Conference in 1884-1885 where European nations began to divide the continent of Africa (Laumann 2013). The Berlin Conference formed arbitrary boundaries as European countries fought for claims to land and cities, often dividing ethnic groups and disturbing traditional movements and interactions. Britain claimed the land that is currently known as Nigeria, as well as Cameroon, while Germany, France, and other European nations divided other portions of Western Africa (Laumann 2013). The implementation of imperialist rule in

order to produce nations that aligned with Western ideals while contributing to European economic growth disrupted the way in which many African institutions functioned (Hansen and Jonsson 2014; Laumann 2013). The borders were completely redrawn in ways that benefited European countries, neglecting the movement and fluidity of pre-colonial ethnic groups such as the Fulani. The direct influence of colonial powers ended by the 1960s when many African nations gained their independence, but groups were forced to adhere to the creation of new state-made boundaries, rather than regaining the complete freedom of movement across the landscape that had occurred prior to colonialism (Laumann 2013). Many African countries subdivided their land into smaller states in an attempt to separate ethnic groups with new arbitrary boundaries that did little to prevent interaction and instead tried to force groups to conform to rigid identities (Benjaminsen et al. 2008). Pre-colonial populations had complete autonomy, but once colonialist and national borders were defined they could no longer maintain traditional movements, as many did not adhere to the drawn boundaries. The effects of the imperialist pacification of Africa can still be recognized within the current conflicts in the region (Laumann 2013; Hansen and Jonsson 2014). A lack of national unity and breakdown of traditional systems and group cohesion are closely related to the current problems facing Nigeria (Abbass 2014). In combination with post-colonial changes to the states, colonization and independence are reflected in the changing ethnic identities within the region.

Ethnic identities and group movements across Western sub-Saharan Africa have historically faced few limitations or boundaries, allowing for the maintenance of fluidity

among members and practices. Prior to colonialism, there were few boundaries that groups conformed to other than ecological constraints and slight cultural distinctions (Hopen 1958). Identities were based on the subsistence practice of the group and existed with a loose, non-Western idea of ethnic identity. These identities were able to be transformed based on marriage practices, alterations to subsistence style, or simply because groups merged together when they became more dependent on each other during environmental changes (Hopen 1958). The adaptive responses contributed to this fluidity. As people attempted to adapt to fluctuating environmental conditions, whether seasonal or climatic, their settlement style often changed. Settlement style, a determinant of ethnic group identity, had implications for the size and relative subsistence practices of the group (Weissleder 2011). This is true for the historical development of the Fulani, and has influenced the group's current structure. Linguistic evidence supports the idea of subsistence practice changes and shows that the Fulani tradition progressed west to east throughout the West African Sahel and spread with the movement of the group (Hopen 1958; Wimmer, Cederman, and Min 2009). As the pre-colonial Fulani changed and developed, power structures began to emerge which altered the traditional subsistence-based identities (Stenning 1957). Many chiefdoms ruled by various ethnic groups rose and fell within the region during the eighteenth century (Hopen 1958). During the Holy War of 1804-1830, the Fulani established rule over the Hausa, absorbing them into the Fulani ethnic group (Stenning 1957; Hopen 1958). Fulani acts as an umbrella term, coined by the British to identify the Fulbe, the group's self-proclaimed name, the Hausa, and other small chiefdoms that once inhabited Northern Nigeria (Hopen 1958; Stenning

1957). Despite the absorption of different ethnic groups into one common identity of the Fulani, the unification of the group was unsuccessful given the British tried to unify numerous different identities in a short period of time. Prior to British colonialism, there was no major Fulani unification because the groups maintained fluid ethnic conceptions that allowed them to be able to move between identities and interact without noticing the small differences between groups (Stenning 1957; Nyamnjoh 2013). The colonial idea of clear dichotomies of farmers and herders, or other subsistence practices for ethnic groups does little to explain the variability of the Fulani (Nyamnjoh 2013). The Fulani, and pastoral people in general, tend to resist cultural change and assimilation more than any other group due to their nomadic tendencies and reliance on movement across the landscape (Hansen and Jonsson 2014; Hopen 1958). Although they were not successfully unified, in that they maintained different practices in terms of subsistence, religion, and rule, the term Fulani still classifies the Fulbe and the Hausa as well as other smaller ethnic groups in the region into one group in the current discourse because of the colonial classification. As the group continued to change, the pastoral segment of the Fulani separated from the ruling and settled Fulani, who lost their pastoral tradition (Stenning 1957). The settled, town Fulani were often exiled from other Fulani because they were no longer seen as true members of the group due to the loss of their traditional practices (Nyamnjoh 2013). These social stratifications took on the political and occupational roles within the group, maintaining the new structure of the society as the nation of Nigeria began to develop, and have been given different names among the Fulani to designate their livelihoods (Stenning 1957). The largest groups of the Fulani are referred to as the

Fulbe na'i and Bororo, or cattle Fulbe; Fulbe ladde, or bush Fulbe; Toroobe, or town Fulbe; and lastly the Bororo'en, who are considered to be remote kin that maintain pastoral traditions, but whose other practices and values differ from the majority of the Fulani (Hopen 1958; Adebayo 1991). Fulbe ladde is often used as an interchangeable term to refer to both cattle Fulbe and bush Fulbe (Adebayo 1991). These divisions of the Fulani are used by the group to refer to themselves and differentiate between subsistence practices and their related identities. The differences between members of the Fulani became increasingly more polarizing as new social stratifications and subsistence practices were established as a result of post-colonialism in the late 20th century (Hopen 1958). As the Fulani developed new practices, their movements changed, resulting in different religious influences and the formation of new cultural traditions (Hopen 1958; Arowosegbe 2009). Whereas the Fulani previously had a symbiotic relationship with other members of the group in the pre-colonial period, the changes in subsistence style in post-colonial Nigeria, in combination with structural changes, created an opportunity for conflict over resource use to emerge.

The different social stratifications of the Fulani can also be categorized as nomadic, semi-sedentary, or sedentary populations. The pastoral Fulani, or Fulbe ladde, are nomadic peoples practicing continuous transhumance and migration to find water and pasture for the herds of cattle they are reliant on (Stenning 1957; Adebayo 1991). The semi-sedentary populations are groups that remain sedentary for portions of the year before moving in order to combat environmental changes, remaining in one place for a large portion of time (Stenning 1957). These groups are commonly referred to as the

Bororo. The Bororo are not to be confused with the Bororo'en, as the Bororo maintain pastoral Fulani traditions (Adebayo 1991). The Bororo'en, although still nomadic pastoralists, vary greatly from traditional Bororo by maintaining animist traditions and a largely closed group (Adebayo 1991). The settled, town, and ruling Fulani maintain a more sedentary way of life, typically adopting horticulture or agriculture as a subsistence style (Stenning 1957). Although these distinctions are not binding, they provide a general understanding for the movement of the populations. Continuously transhumant populations tend not to have Western notions of land rights despite maintaining permanently designated pastures that are used in a seasonal rotation, which creates problems with the sedentary and semi-sedentary populations (Stenning 1957; Turner 2004). Nomadism and transhumance are seen as especially unproductive by the government and sedentary farmers because the land is unutilized for the majority of the year (Benjaminsen et al. 2008). The transhumant land use removes any potential economic benefit for the state whereas exports are possible from settled, sedentary Fulani which contribute to a greater amount of state revenues (Benjaminsen, Maganga, and Abdallah 2009). However, the variations between the different subsistence styles of the Fulani are not as nuanced as these divisions would suggest. Although pastoral Fulani during colonial rule and post-colonialism produced milk to sell, it was sold to local sedentary populations or exchanged for other goods including cereals or root crops (Stenning 1957). Many Fulani pastoralists do not possess land rights, unlike horticulture- or agriculture-practicing Fulani, so they depend on open land to feed and water their

cattle, which results in an increased pressure on the land and exacerbates conflict (Abbass 2014). However, the complementary relationship between subsistence styles still exists.

The conflict within the Sahel region of Nigeria has developed from the accumulation of years of different political, economic, and social problems, which are reflected in the current political ecology and the structural violence of the state. Political ecology examines conflict in terms of resource inequalities among people and the power dynamics within the state (LeBillon and Duffy 2018). Structural violence is interconnected with the approach of political ecology in that it refers to the systemic ways groups are marginalized based on inequalities that can infringe upon the means of meeting basic needs (Farmer 2004). The deep-rooted connection between people's livelihoods and the land has historically been a point of tension between the Fulani. As the climate continues to change in this variable Western region of Africa, tensions are set to rise, resulting in continuing and worsening conflict when combined with the already present structural violence under the political ecology of the region (Abubakar and Ahmed 2017; LeBillon and Duffy 2018). Climate changes are processes that occur in the long-term, happen gradually, and result in fluctuations in the timing and duration of the typical wet and dry seasonal oscillation (Sivakumar 1989; Fox, Rockström, and Barron 2005). It is argued that the large percentage of Africans who rely on natural resources for their livelihoods will face greater occurrences of conflict due to a competition for resources and movement within the region as the effects of anthropogenic climate change escalate in coming years (Akinyemi and Olyaniyan 2017; T. F. Homer-Dixon 1994; Odoemene 2011). The variability within annual temperatures and precipitation rates

suggests a potential for a greater impact from climate change on the continent as compared to other, more temperate regions across the globe (Kurukulasuriya et al. 2006). In combination with the reliance on agriculture and herding for livelihoods, political instability, fluid conceptions of landholding, and lack of cogent, clear regulations pertaining to environment and land use, the changing climate is set to have severe implications and consequences for the security of Africa (Fox, Rockström, and Barron 2005; Kurukulasuriya et al. 2006; Peters 2004; Folami and Folami 2013). The economic, social, and productive implications of the typical weather and the impacts of climate change are especially detrimental to the security of the West African Sahel (Fox, Rockström, and Barron 2005; Folami and Folami 2013; Kurukulasuriya et al. 2006). Increased environmental pressures mean that the Fulani are forced to move about more and deviate from traditional practices, whether sedentary or nomadic, to support their crops or cattle (Ahmadu 2018). Shifts in environmental zones are becoming more prevalent and seasonal changes are less predictable, leading to a disturbance of traditional behaviors. Without the ability to plan for migrations and movements and establish specific locations for watering and grazing cattle, the nomadic Fulani must adapt to the changing conditions as they occur, contributing to the increased interaction between different groups of the Fulani (Akinyemi and Olyaniyan 2017).

The traditional climate within Western sub-Saharan Africa is variable with periods of seasonal variation to long term climate shifts (Fox, Rockström, and Barron 2005). Minimal land is suitable for year round cattle grazing and farming, creating a need for movement or other adaptive mechanisms (Hopen 1958). Most land is not appropriate

for the subsistence practices of the Fulani, which forces the group into a narrow region for the majority of the year. The amount of rainfall within each segment of the region then determines its environmental zone (Hopen 1958). There is little variation in elevation other than some hills and minor changes in terrain, so latitude is the sole determinant in the amount of rainfall in each zone (Odunuga and Badru 2015; Hopen 1958). For this reason, the change in North to South distribution causes a shift in environmental zones. The environmental zones located in sub-Saharan Africa include the Guinea Savanna and the Sudan Savanna, which are bordered on the southern edge by the Guinean Forest and on the north by the Sahel. The Sahel is characterized by intermittent grass cover which is useful for grazing goats and camels but cannot sustain cattle herds (Stenning 1957). The Guinean Forest, in contrast, contains extremely dense vegetation which also prevents cattle from being easily grazed. Land located in northern Nigeria, closer to the Sahel region, tends to be a more arid climate, receiving 450-1050mm of rain annually (Ogungbenro and Morakinyo 2014). Rainfall in the Sahel tends to peak between August and September while November through February sees little rainfall (Akinsanola and Ogunjobi 2014). This is then contrasted with the southern, more humid region, closer to the Guinea Savanna, which sees 1400-2700mm of rain annually (Ogungbenro and Morakinyo 2014). The more southerly the land, the more susceptible the area to an increased seasonal distribution and abundance of Tsetse flies (Blench 1994; Ogungbenro and Morakinyo 2014; Stenning 1957). Although the Guinea Savanna and Guinea Forest see a short dry period referred to as the August Break, it is not enough to prevent the reproduction of the Tsetse fly, which causes Trypanosomiasis, and other mosquitoes,

which cause Malaria, and eliminate the risks associated with practicing pastoralism in the area (Ogungbenro and Morakinyo 2014; Akpodiogaga-a and Odjugo 2010). The middle Savanna zone, or middle belt region, however, is able to be utilized by agriculturalists and pastoralists alike due to the median rainfall of 950-1400mm annually (Ogungbenro and Morakinyo 2014). This amount of rainfall provides both grazing lands and water suitable for cattle and farming, while also limiting the proliferation of the Tsetse fly.

During periods of wet and dry seasons, Sahel-like conditions begin to encroach upon the Sudan Savanna while Guinea Forest conditions begin to spread north. In both seasonal variations, the land that can be inhabited by the cattle-grazing pastoralists is infringed upon by inhospitable conditions or conditions that will impact the wellbeing of their cattle. The dry season is defined by a shift in the direction of the wind, which comes from the Northeast and brings desert air, accompanied by dry spells and an overall reduction in rainfall (Akinsanola and Ogunjobi 2014; Sivakumar 1989). The wet season, in contrast, is defined by prevailing winds from the Atlantic Ocean, bringing humid air and rains, accompanied by the highest wind speeds of the season (Abiodun et al. 2013; Sivakumar 1989). The winds reach their highest speeds and intensity at the onset of the wet season but remain high throughout the year, causing monsoons and dust storms when drought increases eroded soils (Sivakumar 1989). Large tracts of land become seasonally unsuitable for cattle in the north due to the expanding drought-like conditions of the Sahel (Blench 1994). The dry season evaporates standing water and kills plant matter used for sustenance for the cattle. Pastoralists rely on plants because they convert sunlight to energy which requires little to no input by the pastoralists (Swift 1977). Drought

decreases the ability for plants to reach a suitable root depth and erosion and desertification are often a result (Blench 1994). If plants cannot grow in the area, the pastoralists lose a valuable energy source for their cattle and are forced to turn to other methods of energy procurement, such as using farmers' crops and crop remains for fodder (Urama 2005). Droughts and desertification interfere with local production systems, creating temporary problems that can be prolonged by the length of the environmental event (Benjaminsen 2008). The economic capability of Nigeria is reduced during drought periods, causing a greater need for movement and recovery systems (Swift 1977). Though cattle are watered by wells in the intermediate areas during this season, the water supply cannot maintain large herds, which forces the pastoral Fulani to move southward (Blench 1994; Stenning 1957). The Fulani are forced to increase the spatial reach of their household or group in order to cope with drought and still support cattle (Batterbury and Warren 2001). The search for pasture characterizes this period and commences the interaction between the pastoral and semi-sedentary Fulani and the sedentary Fulani, more so than the abundant time of the wet season.

The wet season forces the pastoral Fulani to progress northward in their transhumant migration in order to avoid the seasonal growth of the Tsetse fly (Bassett and Turner 2007; Turner 2004; Stenning 1957). These movements are heavily reliant on weather patterns and environmental conditions. Despite the push to move northward because of the threat of Trypanosomiasis and Malaria, more land is available in the southern region as increased rainfall replenishes surface water and supports better foraging conditions (Bassett and Turner 2007). The Fulani then must decide whether or

not the higher risk of illness in the south is worth the access to the more hospitable conditions in the southern portion of the middle belt region during the dry season. Historically, the pastoral Fulani spent the wet season inhabiting the northern environmental zones until standing water was depleted and the dry season commenced (Bassett and Turner 2007; Stenning 1957). These practices are still followed by the pastoral Fulani with the greater availability of habitable land in the north allowing for further dispersal within the subsistence group (Bassett and Turner 2007). However, the seasonal variations result in changes to the speed and duration of the movement. The unpredictability of seasonal changes can increase the need for pastoralists to change their traditional route and may result in the need to begin moving earlier or later depending on the onset of the seasons (Bassett and Turner 2007). If the natural sources of water are unavailable, the pastoralists must move to more permanent sources of water such as bore holes or pump wells, requiring the pastoral Fulani to change the duration of time they spend in one location (Weissleder 2011). During this time, more land is typically available for both farmers and herders which allows for decreased interaction between the two segments of the population, and therefore decreased potential for conflict.

The Sahel, Sudan Savanna, Guinea Savanna, and Guinea Forest environmental zones are susceptible to extended dry spells, severe meteorological droughts and, more recently, climate change (Sivakumar 1989; Fox, Rockström, and Barron 2005). Historically, the zones have only been faced with naturally occurring dry spells and meteorological droughts throughout the year. Dry spells are prolonged periods without any rainfall lasting anywhere from a few days to a few weeks (Fox, Rockström, and

Barron 2005; Sivakumar 1989). Meteorological droughts occur in the short-term, with one to two years of drought typically occurring over the course of a ten year cycle (Sivakumar 1989). Variation is common within these cycles (Fox, Rockström, and Barron 2005; Rodríguez-Fonseca et al. 2015). However, they are distinguishable from climate change. Anthropogenic climate change has resulted in an increase in the occurrence and intensity of droughts, deviating from the typical annual cycles (Wittig et al. 2007; Nyong, Adesina, and Osman Elasha 2007). The lack of consistency in the seasons and weather patterns prevents both horticulturalists and pastoralists from developing coping mechanisms at the correct times (Sivakumar 1989; Fox, Rockström, and Barron 2005). The delicate nature of subsistence practices and the need to respond to environmental stressors is contributing to increased social and food insecurity (Buhaug et al. 2015). Changing weather patterns in combination with the southward expansion of desert-like conditions and the Sahel have resulted in an increased vulnerability and difficulty to predict and adapt for those in the region.

The intensity of weather events and the variations occurring within both the wet and dry seasons have increased as climate change strengthens and are predicted to have an unprecedented impact (Kurukulasuriya et al. 2006). The most detrimental effects of these variances are not due to changes in seasonal rainfall, but rather the inconsistencies in rainfall throughout the season itself (Fox, Rockström, and Barron 2005). The unpredictability of rainfall events creates problems with lack of percolation and inundation of soils, often resulting in the destruction of crops (Fox, Rockström, and Barron 2005). Today, the traditional subsistence practices and economic development

practices of both small scale and industrial agriculture are heavily reliant on rainfall, as are pastoral practices (Folami and Folami 2013). The rainfall patterning in the environmental zones from the Sahara to the Guinea Forest coastal belt is thus an important factor in determining the success of agricultural processes (Nyong, Adesina, and Osman Elasha 2007). Many areas optimize the dry environment by only planting during the rainy season which makes its onset and length extremely important to crop success (Fasona and Omojola 2005). An early cessation of rains can also reduce yields by limiting the growing season of crops (Adejuwon 2005). Recent rainfall trends have decreased, evidenced by an increase in the duration of the dry season with little contribution to annual rainfall amounts and a large amount of variability in the timing of the rainfall events (Ogungbenro and Morakinyo 2014; Held et al. 2005). The continued shifts in rainfall belts are of concern for current and future agricultural productivity as well as pastoral practices due to the economic, social, and health implications as climate change worsens (Nyong, Adesina, and Osman Elasha 2007; Ogungbenro and Morakinyo 2014; Adejuwon 2005). Climate change and general climate variability exacerbate the structural problems within Nigeria, contributing to insecurity and the instability of relations between the Fulani.

Climate variability in sub-Saharan Africa acts as a limiting factor for the productive processes of agriculture, horticulture, and pastoralism. Subsistence practices are especially susceptible to changing weather patterns and climate as many crops and animals are climate sensitive (Buhaug et al. 2015). The cyclical changes between the wet and dry seasons in past years impacted transhumance and seasonal migration,

determining locations for arable land or lands suitable for grazing (Nyong, Adesina, and Osman Elasha 2007). The seasons and weather also determine which species or crops can be grown in which regions (Wittig et al. 2007). The relative predictability of seasons is necessary for farmers and pastoralists to maximize natural resources and determine how to adapt to any changes (Nyong, Adesina, and Osman Elasha 2007; Wittig et al. 2007). Despite the adaptive capacity of many ethnic groups within the geographic area to cope with climate variability, recent climate change has increased the stresses they face, minimized their ability to actively cope with the changes, and forced farmers and pastoralists to migrate or adopt new, risky technologies in order to continue practicing their livelihoods (Nyong, Adesina, and Osman Elasha 2007). Rural to urban migration is becoming a coping mechanism for the problems affecting the traditional agrarian lifestyle that is the dominant economic activity of the Fulani (Odoemene 2011). A reduction in economically viable land has increased the pressure felt by the Fulani to maintain their livelihoods (Tenuche and Ifatimehin 2009). A lack of adaptive mechanisms to combat environmental change contribute not only to animal and crop losses which are a direct result of the change, but also the indirect result of human losses due to conflict stemming from these resource related issues (Abbass 2014). Adaptive mechanisms are necessary for all subsistence styles given the environmental change, but there is an unequal distribution of the negative effects on the pastoral populations given their method of land use.

The pastoral Fulani have faced an inherently biased land use system since the advent of the post-colonial period. This is a manifestation of the settler versus indigene debate, fighting over who has the higher status, and therefore land and resource access

(Abubakar and Ahmed 2017). In this case, it is the horticulturalists, or farmers, who have advantages over the pastoralists. There is an interest in resource use that is beneficial to the economic development of Nigeria rather than cultural continuity (Benjaminsen et al. 2008; Abbass 2014). Obstruction of typical migration routes as well as preventing access to resources has resulted in numerous violent clashes that place the blame on the pastoralists. The farmers will often retaliate in violent ways, poisoning grazing land or water sources in order to assert their dominance over the land and resources (Salihu 2018; Abbass 2014). The centralized Nigerian government has done little to prevent or mediate these violent conflicts. Although the town Fulbe are defined as ruling, they have very little power unless they are elected to office at the local level which is uncommon (Okello et al. 2014). The Fulani are instead able to maintain traditional, customary institutions that may still be present, and control informal local level law (Okello et al. 2014). The majority of the decisions are made by the centralized government who are typically from other groups and urban areas who lack understanding of what the inequalities experienced by the Fulani and the difficulty in maintaining their traditional subsistence practices (Adamolekun 2013). They have instead demarcated portions of land to set as a grazing route for pastoralists, spanning numerous states (Abbass 2014). However, this forces pastoralists to change their migration while farmers face an unfettered use of their land. Without land rights, pastoral Fulani are forced into marginal areas where the resources are overexploited, putting immense pressure on the land itself. Tensions from this adoption of Western land use have generated a greater concern over resource access and scarcity, bringing in governmental and political components to this conflict.

The current political ecology resonates with the structural violence of Western sub-Saharan Africa, more specifically Nigeria, and is set to further contribute to the instability of Fulani relations. The combination of political, social, and economic factors limit the necessary means for livelihood continuity (Abubakar and Ahmed 2017). This framework captures the idea that the environment, although not a determining factor in group development and success, can impact the way in which a society functions given different pressures on economic means (LeBillon and Duffy 2018). Migration is often used as a coping mechanism for issues of access to means of supporting the population (Ahmadu 2018). In this way, climate change is directly correlated with issues of human security and the general instability of Nigeria, which is set to worsen as its effects are felt. Typically, human security research focuses less on violence as a result of climate change, instead examining numerous other sources of insecurity, largely ignoring a major contributing factor to conflict in the region (Abubakar and Ahmed 2017). Without a strong focus on the human security problems associated with climate change, conflicts can continue to occur unrectified. There is less of a focus on human security and its connection to climate change than health, food security, economic growth, migration, and public properties, such as land and water because of their association with the Millennium Development Goals and improving problems that lower their standing on the United Nation's Human Development Index (Abubakar and Ahmed 2017). A greater focus on climate change and its indirect influence on human security as a result of this complex combination of problems could mitigate and prevent some of the conflicts the Fulani face. Although the other problems of insecurity are still pertinent because of their

indirect causal relationship between climate change and human security, a redefinition of the importance of human security and conflict is necessary to developing better intrastate and interstate relations. The research into this topic is extremely timely and pertinent to the continued development of mechanisms to resolve the ongoing conflict and prevent future conflicts from occurring within Nigeria and the Sahel region as a whole. The growing effects of human insecurity in Nigeria and the negative consequences of the centralized government's inaction require a reframing of the discourse around climate change and insecurity to develop a reconstruction of the Nigerian government with international support and reduce the prevalence of conflict within the country.

Chapter II

Environmental Changes and Resource Access

The impact of the pre-existent natural climate variability and the continued environmental fluctuations due to anthropogenic climate change, whether by greenhouse gas emissions or land use practices, is introducing greater environmental and social pressures to the West African region (Held et al. 2005; Schilling, Scheffran, and Link 2010). The once natural changes to the climate that are now indirectly linked to anthropogenic causes, such as precipitation and temperature change, are easily measurable, giving a clear record of the changing environment (Intergovernmental Panel on Climate Change 2014). It has been shown that temperature has increased over the entire continent of Africa with regional variation in the severity of the change (Akinsanola and Ogunjobi 2014). This is consistent with the mean temperature of warming associated with global climate change (Akpodiogaga-a and Odjugo 2010; Akinsanola and Ogunjobi 2014). As evidenced by figures 1.1 and 1.2, showing rainfall and temperature anomalies for the periods of 1961 to 1990 and 1991 to 2015, rainfall has on average been decreasing while temperature has been increasing.

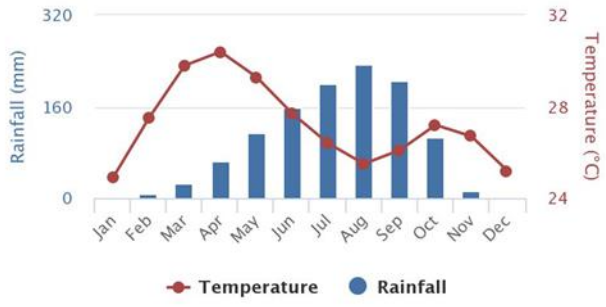


Figure 1.1: Rainfall (blue) and temperature (red) anomalies within Nigeria shown from 1961-1990. Source: The World Bank Group, utilizing a dataset produced by the Climatic Research Unit (CRU) of University of East Anglia (UEA).

Between 1901 and 2005, the mean temperature change in Africa was recorded to be 1.1° Celsius while global change since 1860 is recorded at .74° warmer than the average (Akpodiogaga-a and Odjugo 2010; Intergovernmental Panel on Climate Change 2014). The change in temperature and its impacts are much more evident within Nigeria than the entire continent of Africa because of variety of environmental zones and the combination of environmental changes that is occurring from both the coast and interior of the country. The changes to the ecological factors within Nigeria through the direct influence of climate change are of concern due to the political, economic, social, and human security impacts they are having on Nigerians. Specifically, pastoral and agricultural Fulani experience a disproportionate amount of these negative impacts because of their traditional subsistence practices. The direct impact of the lack of necessary resources alters not only land use and subsistence strategies, but also correlates with the shifts in principles, actions, and interactions of the Fulani. As these changes continue to occur, they are forced to actively adapt, coping in new ways. The presence of a greater external force than natural climate variability has completely changed their responses, often causing greater security problems as a result.

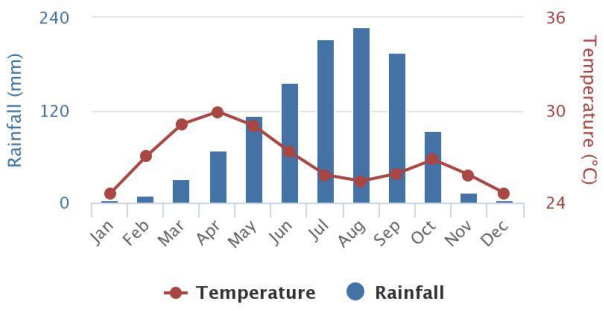


Figure 1.2: Rainfall (blue) and temperature (red) anomalies within Nigeria shown from 1991-2015. Source: The World Bank Group, utilizing a dataset produced by the Climatic Research Unit (CRU) of University of East Anglia (UEA).

It is a common misconception that natural climate variability is synonymous with both climate change and climate variability (Solomon et al. 2011). However, these terms

carry different meanings. The differences between them, although slight, can disprove the assumption that the climate is still only naturally variable and therefore the changes to the climate and environment are nothing out of the ordinary for people in Africa (Crate 2011). This assumption would suggest that Africans would not need to develop new coping mechanisms because they are already familiar with the climate variability. Instead, the causes of these recent changes to the climate are more complex in nature, surpassing what inhabitants of Africa, and more specifically Western Sub-Saharan Africa, have typically adapted to (Batterbury and Warren 2001). The complex interaction between climate change, climate variability, and natural climate variability creates different environmental conditions that are distinct from the purely natural climate variability that occurred within the record (Akpodiogaga-a and Odjugo 2010; Solomon et al. 2011). The unpredictability of environmental changes is increasing the need for mitigation and adaptation, contributing to the instability and insecurity of Nigeria.

Prior to major population growth and technological advancement, natural climate variability was the primary cause of changes to the climate in Africa. Natural climate variability, the changes that would occur regardless of whether or not the area was inhabited by humans, occurs within a climate system without the presence of anthropogenic forcings (Solomon et al. 2011). This includes events that humans cannot influence, such as changes in the Earth's orbit, solar radiation changes, and volcanic eruption, as well as features that influence weather patterns and overall climate including ocean and wind currents (Akpodiogaga-a and Odjugo 2010). Like most subsistence practicing groups across Africa and within Nigeria itself, the Fulani had previously

adapted to natural climate variability, such as wet and dry seasonal oscillation and the presence of droughts occurring in the short-term temporal period (Weissleder 2011; Stenning 1957). These environmental changes were more or less predictable, occurring at the same time each year with little deviation (Bassett and Turner 2007). In response, the Fulani developed coping mechanisms, many of which included north to south movements across the landscape in search of resources in different ecological zones (Stenning 1957; Bassett and Turner 2007). These transhumant patterns and eventual migratory drifts and migrations have become a standard method for dealing with variability within the climate, limiting the need for competition over resources because populations can spread out across the land more evenly, thus preventing conflict during times of natural climate variability (Adriansen 2003).

Within the Sahel, there are strong land surface-atmosphere interactions from both human activities and natural processes (S. E. Nicholson, Funk, and Fink 2018; A. O. P. Odjugo and Isi 2003). These processes all take part in feedback loops which amplify and exacerbate the negative effects of the climate change. Some feedback loops occur separately while others are interconnected through complex processes. This means the anthropogenic changes to the land become a part of the feedback loop and negatively affect the climate, as well as other ecological factors (A. O. P. Odjugo and Isi 2003; Wittig et al. 2007). The ecological factors that are influenced by these climate changes include movement of environmental zones, increasing erosion, desertification, soil infertility, changes to rainfall patterns and quantities, groundwater and surface water availability, and alterations to local plant and animal populations (Wittig et al. 2007; A.

O. P. Odjugo and Isi 2003; Abaje, Sawa, and Ati 2014; Fasona and Omojola 2005). The ecological factors create a natural feedback loop similar to the land use feedback loop; as one factor is altered, it affects other factors, further contributing to the negative effects (Foley et al. 2003). These negative effects become imprinted on the environment, in turn causing ecosystem changes to occur (Foley et al. 2003; S. Nicholson 2000). When a drought occurs, the dry soil takes longer to recover than during a wet year, especially with intensive land use, which contributes to the natural feedback loop (S. Nicholson 2000). Regardless of the temporal scale, the result of the combination of anthropogenic and natural forcings is a deviation from the natural climate variability (Akpodiogaga-a and Odjugo 2010). This deviation is the most important factor within the fluctuations of land

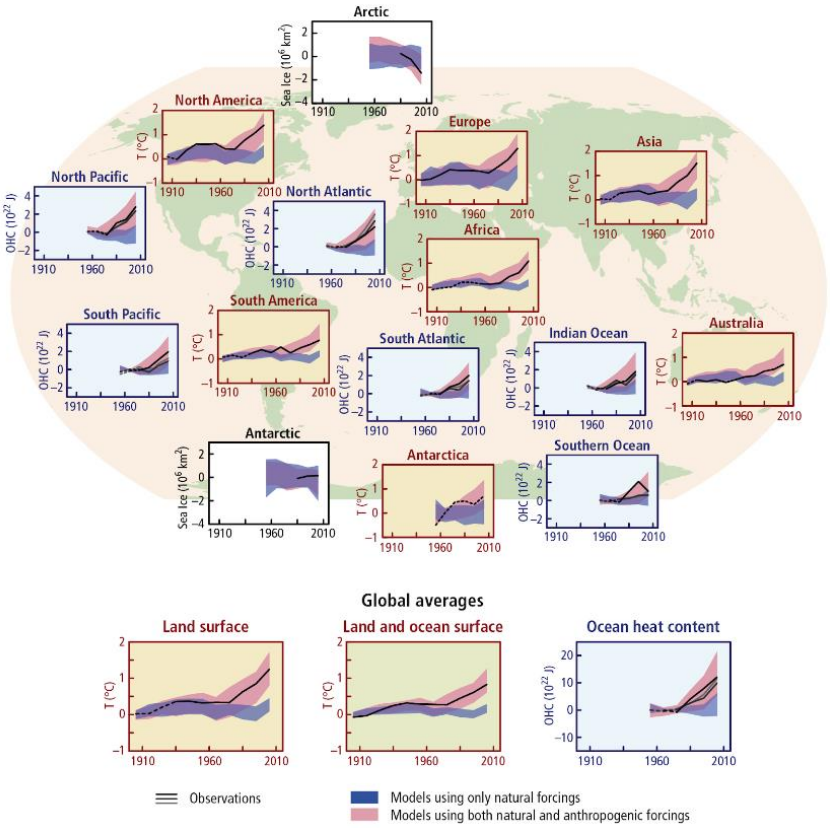


Figure 1.3: A comparison of global land surface temperatures (yellow) and ocean heat content (blue) with models only showing the influence of natural forcings (blue line) and models using both natural and anthropogenic forcings (pink lines), providing global averages for comparison. Source: IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

surface, sea surface, and atmospheric processes because it is the determinant of human responses to the change (Akpodiogaga-a and Odjugo 2010; Adejuwon 2005). Anthropogenic forcings contribute to the land surface, sea surface, and atmospheric changes in different ways and to different extents than natural climate variability, creating different problems associated with each area (S. Nicholson 2000; Solomon et al. 2011). As shown in Figure 1.3, the combined influences of both anthropogenic and natural forcings lead to much stronger impacts than simply natural forcings alone (IPCC 2007). In conjunction, these forcings show a rapid increase in land and ocean temperatures globally (IPCC 2007). Within Africa, the combination of forcings shows a steady deviation from the relatively stagnant influence of natural forcings alone (IPCC 2007). Sea surface temperatures in the North and South Atlantic Ocean, as well as the Indian Ocean, have shown similar effects from both forcings (Held et al. 2005; Janicot, Trzaska, and Poccard 2001).

Sea surface temperature is interconnected with the incidence of drought and other changes to temperature and precipitation (Abiodun et al. 2013; Rodríguez-Fonseca et al. 2015). As the oceans warm, specifically the Atlantic, Pacific, and Indian Oceans, this tends to lead to decreased rainfall over the Sahel region (Rodríguez-Fonseca et al. 2015; Janicot, Trzaska, and Poccard 2001). The dipole connection between the Atlantic and Pacific Ocean sea surface temperatures causes two processes that are opposite of each other, leading to different influences in different regions and acts as another means of interannual variability, or the year to year variation in climate (S. E. Nicholson, Funk, and Fink 2018; Janicot, Trzaska, and Poccard 2001). When one area experiences

increased rainfall, the other tends to experience a trend of decreased rainfall, and when one area experiences a late monsoon season, the other experiences it earlier (Held et al. 2005; Janicot, Trzaska, and Poccard 2001). In this case, the Sahel region in Western Africa tends to experience decreased rainfall while the Guinea Coast, including the states of Warri, Brass, and Calbar, see a slight increase in rainfall (S. E. Nicholson, Funk, and Fink 2018; Janicot, Trzaska, and Poccard 2001; Akpodiogaga and Ovuyovwiroye 2010; Held et al. 2005). This is again an interannual change that has substantial implications for continuous change. The location of the warming is also a factor in the amount of precipitation within the region. The Indian Ocean is often thought to have the weakest effects on precipitation within Africa, due to the fact that other sea surface temperature anomalies can mask its effects (Rodríguez-Fonseca et al. 2015; Held et al. 2005). The global increase in sea surface temperature overall has led to the Indian Ocean basin having a stronger influence over precipitation patterns, allowing its negative influence to overshadow the positive influence of other oceans (Held et al. 2005). The Indian Ocean also acts as a greater indicator for long term variation (Rodríguez-Fonseca et al. 2015). In this case, the rising sea surface temperatures of the Atlantic and Pacific indicate a decrease in precipitation seasonally, while the Indian Ocean determines the continuation of this trend on a decadal time scale (Bader and Latif 2003; Rodríguez-Fonseca et al. 2015; S. E. Nicholson, Funk, and Fink 2018). Despite the general variation in interannual timescales, the overall fluctuations in sea surface temperature have generated a complete change in precipitation patterns (Held et al. 2005; Janicot, Trzaska, and Poccard 2001). Decreased rainfall combined with unpredictability makes it difficult to support

subsistence practices, often having devastating consequences on cattle and humans (Rodríguez-Fonseca et al. 2015; Stenning 1957). The sea surface temperature increase is also thought to be connected to the drying trend over the Sahel throughout the second half of the twentieth century (Bader and Latif 2003; Janicot, Trzaska, and Poccard 2001). Changes in the sea surface temperature can also influence the West African monsoon (S. E. Nicholson 2013). As warming occurs, the monsoon season becomes offset, postponing the large amounts of precipitation until later in the season, disrupting growing seasons and transhumance routes (Rodríguez-Fonseca et al. 2015; S. E. Nicholson 2013). The major and abrupt changes in the climate of the region, or regime shifts are not a new occurrence, but the most recent shift has been human-induced, adding a level of unpredictability.

The first major regime shift occurred as an abrupt shift to desert conditions around 5,500 years ago (Foley et al. 2003). This is the time at which mobile pastoralist cultures began to replace more sedentary, lacustrine traditions (Foley et al. 2003). Regime shifts are typical within any ecosystem and seemingly occur without warning (Scheffer et al. 2001). However, there are often subtle environmental changes that cause the regime shift (Foley et al. 2003). These changes can be relatively minor, or in the case of the second regime shift, major environmental changes such as the increase in anthropogenic influence (Foley et al. 2003; Scheffer et al. 2001). The delicate connection between the land surface-atmosphere interactions and other environmental influences contributes to these abrupt changes (S. E. Nicholson 2013). The second regime shift saw a spike in greenhouse gas emissions, increased temperature, and altered rainfall patterns

(Foley et al. 2003). According to a study by Held et al., a decrease in rainfall is identifiable with this regime shift, deviating from higher precipitation levels characteristic of the wet period and suggesting a continued reduction in the future (Held et al. 2005). At the onset of the 1969 regime shift, the 1950s wet period had begun to end, introducing the drought that is still affecting the region, as identified by the observed mean rainfall trends in Figure 1.4 (S. E. Nicholson 2013). The wet and dry seasonal oscillation had previously been predictable, until 1969, when the second major regime shift occurred, switching from a wet period to a dry period (Foley et al. 2003). This regime shift altered the composition of seasonal patterns (Foley et al. 2003). The seasonal wet period was previously characterized by an increase in rainfall during June through September (Adejuwon 2005). However, the current conditions are contributing to a postponement of the wet season, now starting in July, but still ending in September (Akpodiogaga-a and Odjugo 2010; Bader and Latif 2003; S. E. Nicholson, Funk, and Fink 2018). These regime shifts tended to occur due to changes in the

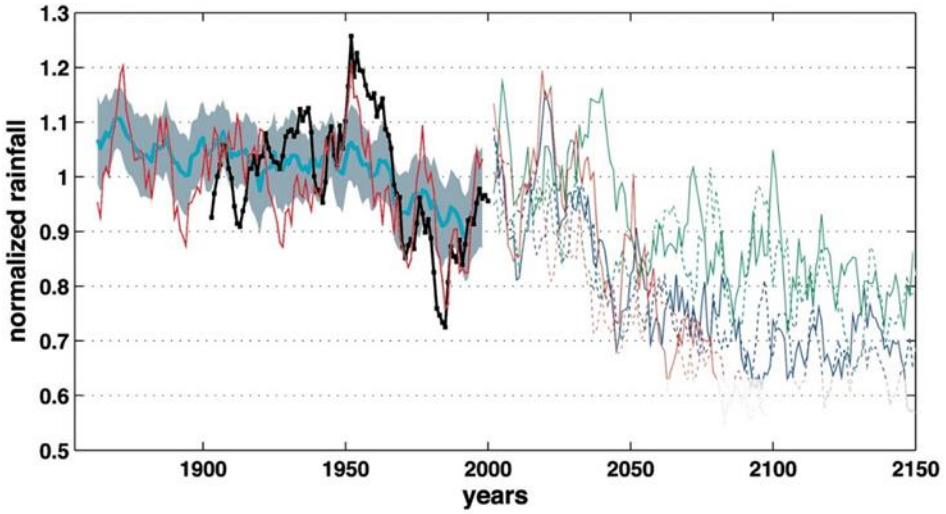


Figure 1.4: Observed Rainfall within the Sahel, with mean values depicted (black line), with the standard deviation (grey area) and future projections (dotted lines) shown. Source: IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

feedback between land surface and atmospheric conditions resulting in a seemingly abrupt change (Foley et al. 2003). An increase in rainfall did occur throughout the 1980s, but the drought continued to persist (S. E. Nicholson, Funk, and Fink 2018). Although there have been periods of slight recovery, these recovery periods are not uniform across the Sahel, or within Nigeria (S. E. Nicholson, Funk, and Fink 2018). The timescales within the Sahel tend to follow 2 to 3, 3 to 5, and 5 to 6 year cycles, whether this be for droughts or for sea surface temperature change (S. E. Nicholson 2013). Unlike other droughts, the drought that began in the 1960s has continued for decades, showing its significance in the changing environment (Foley et al. 2003; Held et al. 2005; S. E. Nicholson 2013). As evidenced by both the changes in sea surface temperatures and rainfall amounts, this regime shift is creating major changes in the timescales of climate trends.

The shift from a wet to dry climate can have negative implications for vegetation and ecosystems in general, which is directly linked to human security (Adejuwon 2005). Drought, especially the prolonged drought that is characteristic of climate change, inhibits plant growth which decreases root growth and increases the risk of erosion (T. F. Homer-Dixon 1994; Aigbe and Oluku 2012; T. Homer-Dixon and Blitt 1998). As vegetation dies, it then reduces rainfall, further reducing vegetation cover, which in turn reduces rainfall again, contributing to the feedback loop and the problems of desertification (Odunuga and Badru 2015). Desertification is characterized by a shift in vegetation from the typical environment which includes trees, to one of bushes and grasses, before finally reaching a point where large tracts of land become areas covered

by sand with desert-like conditions (Olagunju 2015). An increase in erosion and decrease in plant cover leads to a reduction in surface albedo which further amplifies the reduction in rainfall (Odunuga and Badru 2015; Abiodun et al. 2013; Rodríguez-Fonseca et al. 2015). A lower surface albedo leaves less water available to evaporate, contributes to an increase in desert dust, and can then change atmospheric variability (Abiodun et al. 2013; Rodríguez-Fonseca et al. 2015; Akano et al. 2018). The atmosphere plays an important role in maintaining a stable state for the environment to regulate rainfall and temperature (Abiodun et al. 2013). In Western Africa, a reduction in evaporation potential and a subsequent increase in erosion is a significant cause of decreased rainfall and the southward progression of the Sahel, leading to an increase in dust content in the atmosphere (Abiodun et al. 2013; Rodríguez-Fonseca et al. 2015). Atmospheric dust content attributed to cultivation, deforestation, and erosion is thought to have risen and now contributes to 30-50% of the total atmospheric content (S. Nicholson 2000). This has worked to increase the negative feedback loop that reduces precipitation and further increases the intensity and longevity of the current dry conditions in the Sahel.

Once it is established that humans can influence the environment through their land use practices, the continuation of these practices or the development of new adaptations that result in response can both cause greater change (Crate 2011). Although these environmentally degrading actions seem like they are of relatively little consequence, they are in fact closely tied to the continuation and exacerbation of climate change (Rodríguez-Fonseca et al. 2015). The actions of peoples within Nigeria do not contribute to global climate change as much as other developed, polluting nations do, but

they still contribute to changes at the local and region level (Abaje, Sawa, and Ati 2014). These actions are closely connected with regime shifts as there are both natural and anthropogenic components involved. Regime shifts can be due to natural climate variability, however, current regime shifts are due to climate variability. These factors can all affect social interactions among peoples and the relative political ecology of Nigeria, especially when climate variability builds upon itself and transitions to climate change (Odoemene 2011). As the transition to climate change occurs, the ways in which people adapt to these changes can be inherently at odds with traditional practices (Abbass 2014). The IPCC defines climate change as "... a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use" (Intergovernmental Panel on Climate Change 2018). Although climate change is thought of as occurring on different time scales, it is more often associated with being a long term change, typically synonymous with global warming (A. O. P. Odjugo and Isi 2003). As time progresses, the feedback loops present in climate variability are able to become positive, resulting in a buildup and amplification of changes (S. Nicholson 2000). The climate can amplify changes to sea surface temperature, drought, and rainfall throughout the feedback loop,

furthering their negative effects and contributing to the continuation and acceleration of climate change (Aigbe and Oluku 2012). As shown in Figure 1.5, the temporal scales of climate variability and climate change overlap, leading to a more permanent change the longer the cycle occurs. The anthropogenic factors influencing climate change within Africa are as much due to land use as they are greenhouse gases, or what are typically thought of as the influences of global warming (Akpodiogaga-a and Odjugo 2010). All of these natural and anthropogenic forcings have been persistent globally and within Africa, leading to a buildup of disturbances (Crane, Roncoli, and Hoogenboom 2011; Akinsanola and Ogunjobi 2014). Simply put, the decrease in rainfall in the Sahel and the increase of rainfall along the Guinea Coast is characteristic of a long-term climate change, as is the increased temperature.

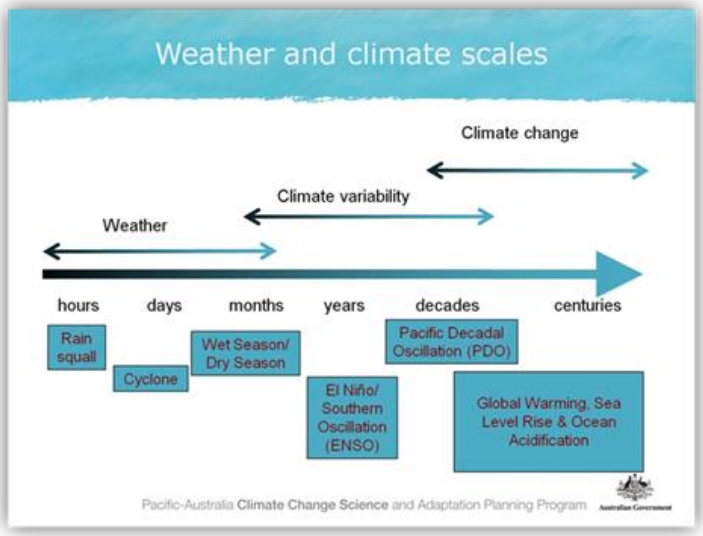


Figure 1.5: Depicts the timescales of weather, climate variability, and climate change, taking into consideration natural and anthropogenic forcings. Source: Pacific-Australia Climate Change Science and Adaptation Planning Program

Although some degree of variability was largely characteristic of Western Sub-Saharan Africa prior to the second regime shift in 1969, anthropogenic causes have had an unprecedented effect on the region, causing greater and more persistent changes than both natural climate variability and climate variability (Crane, Roncoli, and Hoogenboom

2011; Akinyemi and Olyaniyan 2017). The overall changes to the climate occurring both globally and regionally within Western Sub-Saharan Africa have brought to question the impacts on the region as attempts to balance traditional practices with modern adaptation and mitigation techniques are made (Akano et al. 2018; Wittig et al. 2007). In the IPCC's fifth assessment report, the degree of anthropogenic influence is shown to have increased over the years, with significant changes occurring since the 1950s (Intergovernmental Panel on Climate Change 2014). Figure 1.6 shows the different contributions to global surface temperature, with over half of the forcings thought to be anthropogenic in nature. Natural forcings and natural climate variability, referred to in the figure as natural internal variability, have a much smaller contribution to the overall observed surface temperature variation (Intergovernmental Panel on Climate Change 2014). Although natural forcings are a part of the climate changes in Nigeria, they are not enough to be solely responsible for the major climate changes (A. O. P. Odjugo and Isi 2003). As the figure suggests, the amount of influence by natural forcings on sea surface temperature are within tenths of a degree Celsius while combined anthropogenic forcings contribute to over half a degree Celsius increase in

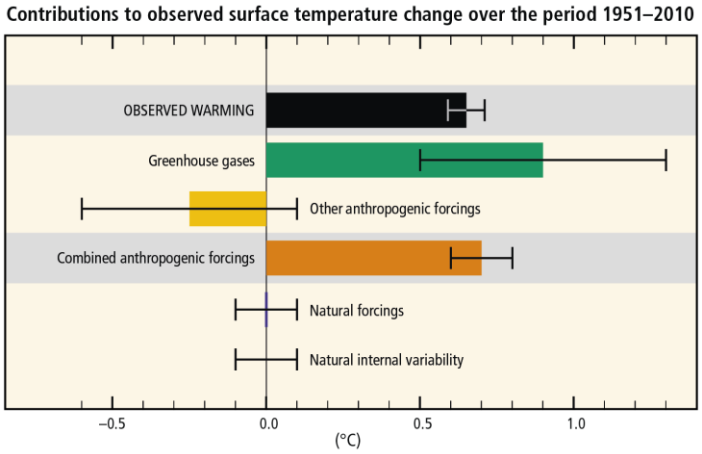


Figure 1.6: Likely ranges for warming trends from 1951-2010 for natural and anthropogenic forcings. This includes the contribution to observed warming (black) from the sources (colored). Source: IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change *[Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.*

temperature (Intergovernmental Panel on Climate Change 2014). It is the combination of factors in the positive feedback system that leads to observed warming and other environmental fluctuations (Foley et al. 2003). These global anthropogenic changes are representative of the deviations from average processes that are impacting the subsistence practices and overall political ecology within the state of Nigeria (Intergovernmental Panel on Climate Change 2014; S. Nicholson 2000). The global and local anthropogenic influences are having detrimental effects on the maintenance of traditional livelihoods for the Fulani, among other cultural groups, inhibiting typical land use practices and movements and contributing to additional conflict (Hsiang, Burke, and Miguel 2013; Odoemene 2011). While the local influences take place on a smaller scale, affecting small geographic areas or segments of environmental zones such as soil fertility or quality, it is the global influences which take place on a much greater scale and can completely alter major climate processes such as ocean currents and sea surface temperature (Fasona and Omojola 2005).

As the population increased and resources became more limited, the Fulani needed to implement new methods to adapt to the anthropogenic and natural changes, creating a greater stress on the environment (Abbass 2014). The changing conditions became accepted as climate variability, a more holistic approach that includes both natural and anthropogenic forcings (Solomon et al. 2011). The Intergovernmental Panel on Climate Change (IPCC) explains that “Climate variability refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all spatial and temporal scales beyond that of individual weather

events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability)" (2018). Determining the combination of external, or anthropogenic, forcings and natural climate variability affecting a region can prove to be a useful tool for understanding ways in which to proceed and adapt to future climate changes that are predicted to become worse (Solomon et al. 2011). The changing climate became exacerbated by the anthropogenic consequences of an increase in Nigeria's population. Since gaining independence in 1960, the population grew from 45 million to a population of 190 million in 2017 (World Bank Group 2019). As a response to the rapid population growth, more land was required for the maintenance of the Fulani's traditional subsistence practices. Higher population densities contributed to an increase in cattle and other livestock which required more grazing land (Majekodunmi 2018). Between 1950 and 2006, the livestock population increased from 6 to 66 million, drastically increasing the pressure on the land (Olagunju 2015). The population growth added additional farmland to the middle belt region, contributing to the decreased availability of grazing land (Okoli and Atelhe 2014). The middle belt makes up the central portion of Nigeria, covering about 333,815 km^2 or about 36% of Nigeria's total land area (Mage and Tyubee 2019). New methods of adaptation beyond movement became necessary to support cattle and agriculture with the increased pressure on the land in this region, which further impacted the environment (S. E. Nicholson, Funk, and Fink 2018). The transition to irrigation and bush burning in order to combat the changes associated with climate variability resulted in a feedback loop, creating a greater reliance on these systems as the

climate continued to change (Olagunju 2015; Ogo-Oluwa 2017). The human influence on the climate through land use became a mainstay of the Fulani's subsistence practices, continuously impacting the typical natural climate variability, in combination with global practices influencing the climate (Olagunju 2015). The distinction between internal, natural climate variability and external, anthropogenic climate change is largely arbitrary for subsistence practicing populations (Crane, Roncoli, and Hoogenboom 2011). Regardless of the reason for the environmental changes, the populations must still adapt (Akinyemi and Olyaniyan 2017; Crane, Roncoli, and Hoogenboom 2011). However, this remains relevant in research because it explains why anthropogenic climate change affects vulnerability and conflict which are having greater impacts on populations in the Sahel than natural climate variability would alone (Akinyemi and Olyaniyan 2017; Crate 2011).

Population growth, oil exploration, and land use change as a response to climate fluctuations have become the leading local causes of climate change within Nigeria while increased emissions, global population growth, and land use changes contribute more so to regional changes within Western Africa (Fasona and Omojola 2005). Land use and resource use changes are key anthropogenic influences on global climate change, largely focusing on the amount of land intensively used for subsistence practices, population growth, and greenhouse gas production (A. O. P. Odjugo and Isi 2003; Wittig et al. 2007). These changes to land and resource use are therefore causally connected with the negative consequences of climate change, and have worked in combination with other anthropogenic forcings to cause ecosystem destabilization, resulting in changes to

vegetation composition and animal populations (A. O. P. Odjugo and Isi 2003). Typically, the natural vegetation within the Sahel region follows cycles of annual dieback, and is then used by pastoralists for animal fodder (Urama 2005). However, as the population has increased, more land is used, more people migrate to find better lands, or new methods can be used to intensify resource use or adapt to a decrease in resource availability (Swift 1977). If the land becomes overused and degraded, feedback loops within the environment can cause it to reach a point where the ecosystem cannot naturally renew itself, exacerbating original problems (Abiodun et al. 2013). As population growth occurs, the corresponding increase in overgrazing and land clearing are major factors in the desertification of the land (Schilling, Scheffran, and Link 2010). The extent of sand dunes and deposits increased by 425% between the years of 1976 and 1995 in northeast Nigeria, worsening as climate change's effects are felt more strongly (Obioha 2008). Desertification has led to a marked decrease in arable land and a shift in the composition of vegetation making the maintenance of subsistence practices more difficult (Buhaug et al. 2015). Though traditional land use practices are still maintained, desertification has caused the people of Nigeria to implement a combination of new practices in attempts to increase productivity and economic viability.

Technological intervention by farmers, including irrigation, further contributes to changes in the environment, especially when combined with traditional practices such as bush burning (Urama 2005; A. O. P. Odjugo and Isi 2003; Ogo-Oluwa 2017). Bush burning, or the act of purposefully setting a forested area on fire to increase grasses for grazing or clear land for farming, is still occurring (A. O. P. Odjugo and Isi 2003).

Despite bush burning only being used on small scales, the Nigerian residents who participated in a study by Odjugo and Isi, including both farmers and pastoralists, considered this to be significant enough to act as a cause of desertification in Nigeria (A. O. P. Odjugo and Isi 2003). If farmers and herders continuously utilize bush burning as a means of clearing land, the soil is unable to regenerate and there is a subsequent decrease in fertility (Olagunju 2015). The use of bush burning and resultant desertification is one aspect of environmental change that has contributed to rural-urban migration in order to avoid the negative effects of the technological intervention (Abaje, Sawa, and Ati 2014). Water is another climate-dependent resource that is deeply tied to subsistence practices, especially when altered by technological processes or polluted by oil exploration. Poor irrigation practices combined with the already variable rainfall patterns influence the rate at which the surface water and groundwater stores recharge (A. O. P. Odjugo and Isi 2003; Ogo-Oluwa 2017). Only around 6% of Nigeria's crops are irrigated with the majority relying on rain (Buhaug et al. 2015). Given the nation's heavy reliance on rain-fed agriculture and the use of ground and surface water stores to support the subsistence practices of the Fulani, the stability and predictability of this system is extremely important to the maintenance of traditional practices (Abbass 2014). Reduced soil moisture and atmospheric moisture content from climate change and increased use of resources contribute to a decrease in crop yields and an increase in food insecurity as well as reduced capacity for farmers to make a viable livelihood (Abaje, Sawa, and Ati 2014). Thus, the changing climate poses a security risk as traditional practices are forced to be altered to combat these conditions (Abubakar and Ahmed 2017). According to Odjugo

and Isi's study, Nigerian residents attributed the primary causes of desertification to natural changes, such as the increase in temperature and decrease in rainfall, with anthropogenic land use changes and population growth still contributing to these problems (A. O. P. Odjugo and Isi 2003). Again, though the distinction between natural and anthropogenic causes is not seen by Nigerians as important, academic study has shown that it is key to reducing insecurity associated with desertification and other effects of climate change. For Nigerians, the concern is simply that there are noticeable changes occurring to the environment that are infringing upon their traditional subsistence practices. Lake Chad and other bodies of water have significantly decreased in size since the second regime shift, a change which is clearly observable to Nigerians. Lake Chad's depth has also continually decreased which results in a smaller surface area, leaving the area in 2000 as just 5.7% of the area of the lake in 1963 (Akpodiogaga-a and Odjugo 2010). Drastic changes such as desertification and the shrinking of Lake Chad are causing the effects of climate change to be felt disproportionately among the population as the intensity increases. Most of the effects are felt by the poor in Nigeria, which typically includes those who rely on subsistence practices as they have less of an ability to cope with these changes (Akpodiogaga-a and Odjugo 2010). This means that most of the Fulani are considered to be poor because of limited access to resources (Thelma 2015). The inequality further threatens stability and requires new methods of adaptation and mitigation to be developed to balance the structural and environmental problems.

The anthropogenic element in addition to natural climate variability is what sets the second regime shift apart from other climate changes. The persistence of the drought

in incomparable to any other drought on record (Held et al. 2005; A. O. P. Odjugo and Isi 2003). These changes have largely occurred since the beginning of the Industrial Revolution, creating an increase in greenhouse gas emissions and a decrease in carbon sinks (A. O. P. Odjugo and Isi 2003). The continued greenhouse gas emissions and population growth were correlated with the onset of the second regime shift (Foley et al. 2003). Only when projections were modeled using both natural and anthropogenic forcings did the 20th century warming model show a significant trend (Held et al. 2005). This combinations acts as an explanation for the rapid change (Foley et al. 2003). Despite the predisposition of environments to have two stable states, the second regime shift had the addition of anthropogenic forcings which caused it to rapidly change from its equilibrium state (Held et al. 2005; Foley et al. 2003; Intergovernmental Panel on Climate Change 2014). Figure 1.7 shows the global influence of increased CO_2 emissions which reflect the anthropogenic changes influencing Nigeria. The combined effects of natural and anthropogenic forcings have altered the entire climate of Western Sub-Saharan Africa (Held et al. 2005). Although changes to the landscape have been gradually occurring, the general onset of these

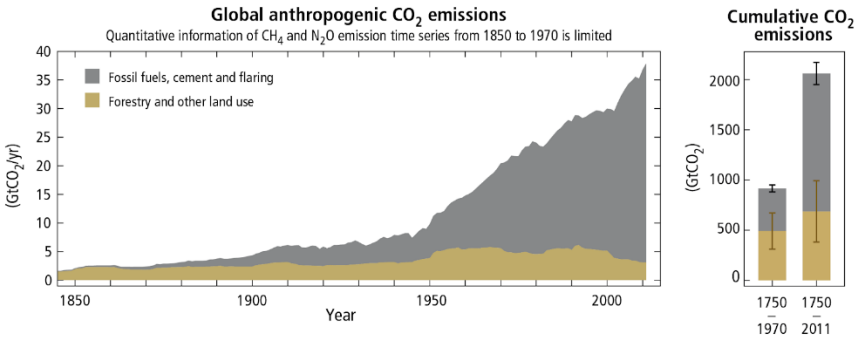


Figure 1.7: Global annual carbon dioxide emissions with cumulative emissions and the standard deviation shown. Source: IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change *[Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.*

changes has happened rather rapidly since the Industrial Revolution with the effects exponentially growing as climate change worsens (Rodríguez-Fonseca et al. 2015; Intergovernmental Panel on Climate Change 2014). These effects are forcing the Fulani to adapt to worsening environmental conditions while competing for increasingly scarce resources (Buhaug et al. 2015). The amount of desertified lands has been rapidly increasing since the second regime shift in Nigeria. The entire 720,902 km^2 landmass in the twenty states making up northern region of the country is composed of 260,417 km^2 of desertified land, making up 36.1% of the total northern land mass (A. O. P. Odjugo and Isi 2003). In total, Nigeria has a land mass of 925,000km^2, of which 28.2% is desertified (A. O. P. Odjugo and Isi 2003). This translates to a southward advance of the Sahara by 4km in the 1980s, 7km from 1990-1995, and 8km from 1996-2000, with each year gradually increasing the amount of desertified land (A. O. P. Odjugo and Isi 2003). Valuable land for subsistence practice maintenance is not only being lost through the southward progression of the desert, but also desertification due to deforestation and other land use changes. The percentage of forested land area in Nigeria has decreased from 12.2% in 2005 to 9.9% in 2010, and to the most recently observed change to 8.1% in 2017 (Food and Agriculture Organization of the United Nations 2014). Between 2000 and 2010, Nigeria nearly halved the amount of forested land that remained from the major 60% decrease that occurred between 1850 and 1960 (Olagunju 2015; Aigbe and Oluku 2012). Because so little forested land remains, the areas that were originally protected from desertification can now experience these problems (Abaje, Sawa, and Ati 2014). The anthropogenic land use changes of deforestation and greenhouse gas caused

climate changes, combined with natural forcings are contributing to the estimated 63.83% of land area that is experiencing some degree of desertification (Olagunju 2015). Fifteen states are on the frontline of the desertification, experiencing fully desertified areas of land (Olagunju 2015). These frontline states are largely concentrated within the northern half of the country, roughly correlating with the southward progression of the Sahel in the movement of environmental zones (Thelma 2015). However, these states also overlap with the middle belt region, which is the most agriculturally productive and fertile region in Nigeria (Mage and Tyubee 2019; Thelma 2015). This overlap of frontline states and middle belt states shows the risk that is associated with the southward progression of the Sahel. The middle belt states are unable to meet their productive capacity if desertification and drought occur. This decreases the availability of fertile land for livelihoods to utilize in the states that are both frontline and middle belt states. Once fertile states are now experiencing reduced rainfall and changing weather patterns which cause continued desertification. Although the majority of states are experiencing desertification, some coastal states have even seen a slight increase in

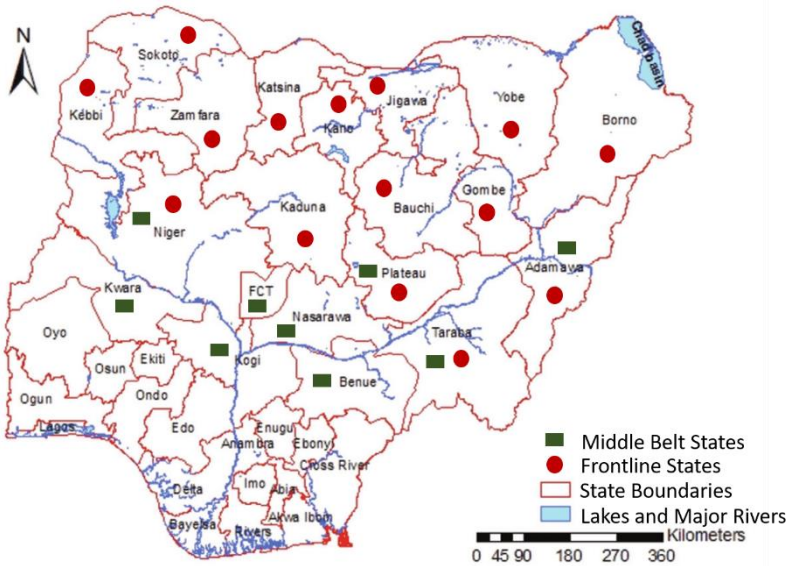


Figure 1.8: The location of the frontline states and the middle belt states of Nigeria

rainfall, showing the complete variability in the effects of climate change (Akpodiogaga-a and Odjugo 2010). As the Fulani attempt to combat the changing conditions, the anthropogenic response is to attempt to adapt to continue livelihoods which intensifies land use and the feedback mechanisms that negatively affect the environment. This response not only contributes an anthropogenic component to the feedback cycle of natural forcings, but it also results in changes to adaptation and mitigation.

Chapter III

Political Ecology and Structural Violence

The farmer-herder conflicts that are currently affecting populations in the Sahel are largely structural. These conflicts are caused by many different factors that affect both pastoralists and horticulturalists, including the environmental factors that are a direct result of climate change. Conflict here is defined as any display of violence or aggression, including individual levels of aggression, intrastate civil war, insurgency, interstate manifestations of aggression, and other displays both within and between states (Hsiang, Burke, and Miguel 2013). Different forms of conflict have different causes depending on the perception of opposition (Buhaug et al. 2015). The link between the environment and conflict, although not direct, is extremely important in discussing the political ecology of the state of Nigeria, as well as many other sub-Saharan states (Buhaug et al. 2015; Raleigh 2010). Rather than adopting an environmental scarcity framework like Thomas Homer-Dixon, a political ecology approach frames the environmental conflicts in relation to structural violence. Structural violence is a form of violence that is exerted systematically and indirectly on an entire social order (Farmer 2004). This violence manifests itself as adverse events that can prevent people from meeting their basic needs, often resulting in physical violence and conflict (Raleigh 2010; Farmer 2004). The connection between the two approaches of political ecology and structural violence helps to create a complete framework for discussing the complex combination of influences on the state of Nigeria and the conflict that occurs as a result (Raleigh 2010). In different

populations, the same causes can create different outcomes given the effects of other causal linkages such as religion and ideological differences (Abbass 2014). The conflict that occurs as a result can range from as small as a local, individual altercation to complete statewide rebellions (Moritz 2010). The differences among the populations, such as farmers and herders, are often minor, but are used to justify different power dynamics and methods for gaining autonomy in the eyes of the state (Arowosegbe 2009; Fasona and Omojola 2005; Nyamnjoh 2013). Not all conflicts are a result of differences such as these, some can simply be due to basic problems associated with resource allocation or state acceptance of their livelihood (Fasona and Omojola 2005). Many of the conflicts that occur are among groups who have more similarities than differences, framing these conflicts as intra-ethnic in nature (Raleigh 2010). Because many of these conflicts are among members of the same ethnic groups and occur on the local level, they are often seen as small scale, low-intensity conflicts that are of little risk for security (Moritz 2010). However, though they start as singular incidents, they frequently spread to become major problems across the entire state and region (Arowosegbe 2009; Moritz 2010). Structural violence often creates these singular incidents because of a shared problem within the social order (Farmer 2004). Environmental factors are one such element that are shared by the entire population, both locally and nationally, making them a causal problem of structural violence that can manifest in numerous different incidents (Moritz 2010; Farmer 2004). As this structural violence is expressed within the political ecology of the state, different responses are necessary for coping with and mitigating the problems associated with an increased incidence of conflict.

Issues of climate security and the discourse on ethnic clashes that surrounds it are not limited to the Sahel, or Africa itself. Although the effects of climate change are more apparent in Africa due to geographic, social, and political factors, climate change also has drastically negative effects on other populations (Folami and Folami 2013). Climate-related conflicts are extremely prevalent globally, with several conflicts occurring in Sudan, Mali, Kenya, Iraq, and Tibet, among other places (Wimmer, Cederman, and Min 2009; Osinubi and Osinubi 2006). As the effects of climate change increase in scope, more land becomes marginal, causing a fundamental change in the level of competition among people and how they resolve conflict (Ahmadu 2018). The stress that is placed on peoples, especially those with the economic practices of subsistence livelihoods, to maintain and survive utilizing these practices within marginal environments causes a rise in tensions (Ahmadu 2018). The social consequences that become apparent when the state does not support certain livelihoods increases the human insecurity (Odoemene 2011). Although these groups previously maintained neutral or symbiotic relationships, in times of increased environmental stress, minor differences become the focus (Kolstø 2007). This is especially true when migration becomes the necessary coping mechanism for youths to deal with poor socioeconomic standing and disillusionment (Adesoji 2011). The massive influx of young men into new countries, mainly concentrated in urban environments, can lead to further conflict (Adewale 2005; Abubakar and Ahmed 2017). The unemployment of disillusioned men can lead to a surge in the adoption of fundamentalist ideas as a means for both economic gain and retaliation against the oppression of the state (Adesoji 2011; Jike 2004). This is especially apparent in Nigeria,

where youth restiveness has become a direct result of structural violence (Arowosegbe 2009; Odoemene 2011).

Migration and change in settlement locations have become adaptive mechanisms for dealing with environmental conditions and structural violence among those practicing traditional subsistence methods (McLeman and Hunter 2010). In Nigeria, pastoral and semi-sedentary or sedentary horticulturalist Fulani are perhaps the two populations that are most affected by the fluctuations associated with climate change (Ahmadu 2018). However, all subsistence-practicing Fulani are affected by the fluctuations to some degree, as subsistence practices are tied directly to the environment (Akano et al. 2018). Much of the Nigerian economy is based off of natural resources, which impacts the livelihoods of even the Bororo'en, who were exiled from the group because their adoption of modern practices (Nyamnjoh 2013; Buhaug et al. 2015). There is an active effort for the subsistence-practicing Fulani to distinguish themselves from both the Bororo'en and now the modern, ruling Fulani who have lost their sense of what it is to be a true Fulani (Nyamnjoh 2013). As the ruling Fulani adopted new technologies and became more modernized, those who see themselves as true Fulani began to resent their attempts to actually rule (Nyamnjoh 2013). Regardless of the view that ruling Fulani are not true Fulani, many of the industries which they make their livelihoods from are actively tied to natural resources (Stenning 1957). Changes to seasonal and annual precipitation and temperatures can be detrimental to these communities, increasing social and environmental pressure on all groups of Fulani (Abiodun et al. 2013). A lack of knowledge of the timing and severity of environmental changes to the typical patterns

that influence their movement can impact the route that subsistence-practicing Fulani follow, albeit either pastoralists or agriculturalists (Ahmadu 2018). Farmers and pastoralists tend to rely on migration, indigenous knowledge, or technologies, often in some combination, to mitigate the effects of climate change in attempts to successfully continue their subsistence practices (Urama 2005; Nyong, Adesina, and Osman Elasha 2007). Agriculture is still Africa's largest industry for employment, livelihood maintenance, and GDP contributions (Buhaug et al. 2015). The continued reliance on natural resources for economic productivity, whether at the industrial or subsistence level, makes environmental changes extremely important to the security of both Nigeria and Africa as a whole.

Identity is closely related to livelihood practices in Nigeria. The act of continuing subsistence practices is an important factor in the identity of the Fulani, as a shift to modern practices can signify a movement away from Fulani traditions and result in a lack of acceptance among the community (Adriansen 2003; Nyamnjoh 2013). When livelihoods become disrupted, it causes a deviation from their identity and the need to redefine it (Crate 2011; Nyamnjoh 2013). Although Nigeria is a fluid and plural society with many different ideas and practices within the confines of the small state, changes to identity can be a determining factor in conflict because they are so closely related to how the Fulani interact with one another and their environment (Adriansen 2003; Abbass 2014; Nyamnjoh 2013). Redefinition of identities has been continuously occurring as different religious, social, and political influences manifested themselves among the Fulani (Majekodunmi 2018; Nyamnjoh 2013). Fulani often alter their subsistence

practices depending on the environmental conditions of a period, but are still able to revert back to their prior methods when conditions change again (Nyamnjoh 2013). This can include adding agricultural plots for pastoralists, or farmers maintaining small herds (Stenning 1957; Blench 1994). In a sense this creates an insurance policy for their economic methods. However, it does not change what the Fulani identify as in terms of their subsistence, as they still maintain their dominant livelihood strategy (Nyamnjoh 2013). An imposition or hindrance on the continuation of a subsistence practice can increase insecurity for the Fulani, as it is their identity that helps maintain cohesion and relatively peaceful interaction (Arowosegbe 2009; Majekodunmi 2018). Pastoral Fulani are especially reliant on their subsistence practice for their identity. Predominantly relying on cattle for livelihood is the mark of being a pastoral Fulani, regardless of the mobility method one chooses to assume (Adriansen 2003; Hopen 1958). A threat to a Fulani's cattle is equivalent to a threat to their own identity (Okoli and Atelhe 2014). In this case there is still a connection to place, but it is less important than the ownership of cattle (Nyamnjoh 2013). The settled Fulani who practice horticulturalism are also reliant on their subsistence practice for their identity, but have a stronger sense of autochthony (Nyamnjoh 2013). Many of the horticulturalist Fulani take part in traditions that are akin to semi-sedentary or agro-pastoralist traditions (Adriansen 2003). Horticulturists and agro-pastoralists often maintain cattle, but many supplement the pastoralist Fulani's strong reliance on cattle with other activities (Majekodunmi 2018). These groups do not practice as much movement across the landscape as traditional nomadic pastoralists. Because of the inherent reliance on the land, whether for agriculture or cattle, the strong

sense of identity that comes from the subsistence practice causes the two groups, the horticulturalists and pastoralists, of the Fulani to be largely at odds with each other as resources are reduced by climate change.

The practice of transhumance carefully intertwines the social and ecological factors to prevent competition for resources and the death of cattle in the marginal environment. The typical seasonal variability in Nigeria causes periods of dispersal and concentration for those practicing transhumance. When the area experiences the hot, dry season, herding becomes much more difficult, so the Fulani disperse (Hopen 1958). The groups become much more individualistic, transitioning from clans and tribes to individual family units to maintain cattle (Stenning 1957; Majekodunmi 2018). When the dry season transitions to the cooler wet season, concentration occurs and the individuals rejoin one another (Hopen 1958). At this time, herding is easier, and cattle need only travel short distances for pasture and water, leaving more time for communal rites and rituals to occur (Majekodunmi 2018). It becomes a time of ceremony and celebration for surviving another dry season (Hopen 1958). Kin are more reliant on each other, as opposed to the stronger competition for resources that necessitates the dispersal in the dry season. The cohesion of the group is extremely important to maintain for times when goods need to be exchanged or rites need to be performed (Hopen 1958). The act of maintaining a herd immediately acts as a form of membership to the group of pastoral Fulani which creates a much stronger bond than kinship alone (Hopen 1958).

Because of the continual movement in transhumance orbits during periods of dispersal and cohesion, a symbiotic relationship formed among the pastoral Fulani and

those with which they were sharing land and resources. Before being colonized by the British, gifts of dairy products from the herd were used to secure land use in a peaceful manner if the pastoral Fulani were to stop near someone else's land during their route (Olaniyan and Yahaya 2016; Majekodunmi 2018). This type of system has been present since the beginning of nomadic pastoralism when the trade between subsistence economies was necessary not only to gain useful items that each party was unable to obtain on their own, but also to keep peace between practices (Swift 1977; Majekodunmi 2018). The system showed that the pastoral Fulani acknowledged their impact on resource use in the area and wanted to assure their peaceful presence. Then, when the Fulani began to move again, the symbiotic relationship would cease, as there was no longer a competition for resources in the same area or need for the mutual benefit. This process continued in some capacity until the onset of the second regime shift. The symbiotic relationship is still carried out to some degree, as there are many things such as cloth that pastoralists still must trade for, as well dairy that horticulturalists trade for (Majekodunmi 2018; Swift 1977). Although many pastoralists can survive off of the byproducts of their cattle during a good year, there are many times in which their diet needs to be supplemented by grains and other farmed goods as well (Swift 1977). These times are increasing as climate change causes fewer good years and more issues with cattle (Majekodunmi 2018). Today, the relationship between pastoralists and horticulturalists is characterized by a more even exchange of goods for trade, rather than as a gift to show an intent for peaceful existence. It is not uncommon for Fulani to trade milk from their cattle, which has a higher economic value, for grain in order to reduce

food insecurity (Majekodunmi 2018). Many Fulani who have deviated from the traditional subsistence methods have now transitioned to treating cattle as capital that are able to be sold, rather than a source of byproducts that can be used to trade in order to obtain grains to supplement their diet (Swift 1977). The change in relationships between herders and farmers has altered the way in which subsistence practices function, shifting from a means of attaining calories to a more modern guise of economics.

Although it is often thought that cattle rustling has been a major source of conflict between pastoral Fulani, historically it was a relatively refined process wherein cattle raiding was done on a small scale, following seasonal traditions, and done with little violence (Olaniyan and Yahaya 2016). It rarely infringed upon the peace between groups as it was done as a means of showing bravery and honor, typically with nonviolent shows of strength (Olaniyan and Yahaya 2016). It allowed for the maintenance of the pastoral Fulani identity by providing another way in which to show dedication to the group and maintain cohesion (Nyamnjoh 2013). Current cattle rustling has taken on a new form, characterized by increased violence, due to identity shifts and structural instability resulting in the formation of new interactions among Fulani with no conflict resolution systems (Olaniyan and Yahaya 2016; Moritz 2010). As the Fulani are forced into new areas, different groups cross paths and traditional host communities cannot be used. Host communities, or the sedentary populations in an area where pastoral Fulani moved to, typically involved a farmer-herder symbiotic relationship or compensation by the herders to the farmers for the use of resources (Swift 1977; Hopen 1958; Olaniyan and Yahaya 2016). Any imposition on the herder's cattle by farmers creates an inherent disruption in

this system. The farmers and herders developed a structure of local leadership where there could be negotiations between parties, with the chief, or with the local council (Beeler 2006). Maintaining this structure permitted negotiations, allowed for conflict resolution between the groups, and protected the system of symbiosis and reciprocity (Majekodunmi 2018). A disruption of these structures therefore changes the practice from one that is symbiotic to one that places herders and farmers in violent opposition with one another (Arowosegbe 2009). As cohesion continues to break down, host communities are facing increased accusations of cattle rustling because of the proximity of rustling to the farming community, often resulting in the use of automatic weapons and the killing of farmers and pastoralists (Olaniyan and Yahaya 2016; Salihu 2018). This leads the herders to assume that it is the new host community that is responsible for stealing livestock (Salihu 2018). Within the past two decades, occurrences of cattle rustling have greatly increased (Ahmadu 2018; Majekodunmi 2018). It is a particularly attractive method of economic gain for terrorist organizations and organized crime cartels (Majekodunmi 2018). Many groups, primarily the fundamentalist group Boko Haram, have capitalized on the breakdown of cohesion and the lack of organization among the Fulani for mobilization, using cattle rustling with the assistance of automatic weapons as a means of increasing profits by selling cattle as the demand for beef increases (Raleigh 2010; Majekodunmi 2018). Many of these violent crimes are committed by terrorist groups and organizations such as Boko Haram, but accidentally attributed to the Fulani by the government and citizens (Majekodunmi 2018). Outsiders also blame the Fulani, framing them as more aggressive than they are and increasing tensions further by allowing the

government to justify their marginalization of the groups, thus continuing the structural violence (Majekodunmi 2018; Raleigh 2010). However, the Fulani are not entirely blameless. They do still commit many cattle rustling crimes, but to a lesser magnitude than perceived (Ahmadu 2018). The lack of cohesion leads individuals or small bands of Fulani to participate in cattle rustling as a way to retaliate against other Fulani over natural resource use or land rights, to achieve economic gain, or simply to get revenge for previous cattle rustling incidents (Ahmadu 2018; Arowosegbe 2009; Majekodunmi 2018; Abbass 2014).

Each subsistence practice has a different degree of adaptation and mitigation that is necessary to deal with natural climate variability. The existence of subsistence practices within the modern state creates a need for not only new ways to adapt to and mitigate changing climate extremes, but also ways to maintain the practice and its associated identity. However, these practices often become obsolete or interrupted by the increase in negative changes associated with climate change, leading many young men to leave the subsistence practice in search of other means of livelihood. Climate vulnerability, the ability for populations to react to the impacts of climate change in marginal climates internationally, has rapidly increased in conjunction with population growth (Swift 1977; Crane, Roncoli, and Hoogenboom 2011). This has contributed to an unmetered competition between the groups of Fulani practicing different traditions. Adaptation to climate vulnerability is a fundamental mechanism for populations to mitigate the risks associated with climate change (McLeman and Hunter 2010; Akinyemi and Olyaniyan 2017). It is increasingly important for populations in the Sahelian region

to adopt adaptive mechanisms in order to decrease risks to their livelihoods (Akinyemi and Olyaniyan 2017). However, due to the shrinking availability of habitable land in the middle belt of Nigeria, there are limited adaptive mechanisms available to the groups. Between 20-30% of the total land area of Nigeria is becoming desertified with the rate of desertification occurring at around an 8km southward progression per year between 1996-2000, increasing from the 7km progression in 1990-1995, and the 4km progression in the 1980s (Olagunju 2015; A. O. P. Odjugo and Isi 2003; Obioha 2008). In combination with the already existent desert area, Nigeria is losing 351,000 km^2 to desert and desertified land (Aigbe and Oluku 2012). Annually, the Sahel is progressing southward at a rate of around 3,626 km^2 (Ahmadu 2018). Over half of all states have been affected by desertification in some capacity (Olagunju 2015). The shrinking availability of water resources is also creating problems as there tend to be large concentrations of people around water sources (P. A. O. Odjugo 2010). As water sources are reduced, more people must consolidate into smaller areas and share a decreased resource (Obioha 2008). Adaptation does not imply that solutions must come from technology or traditional ecological knowledge. Peoples engaging in adaptation can instead utilize variations on seasonal movements or greater migrations to cope (Akinyemi and Olyaniyan 2017; Swift 1977). With the continually southward progressing Sahara and variability in rain, migration is becoming an ever-popular adaptive coping mechanism (Akinyemi and Olyaniyan 2017). Many Nigerians are also being displaced by rising sea levels which results in a northward movement of peoples into the middle belt region of Nigeria (Akpodiogaga-a and Odjugo 2010; Idowu et al. 2011). The current .2

meter sea level rise has already resulted in a loss of about 3,400 km^2 of coastal land, with this expected to increase to 18,400 km^2 by 2100 (Akpodiogaga-a and Odjugo 2010). Coastline erosion is especially prevalent in Lagos state, home to Nigeria's largest city with a large percentage of the population living in poverty (Adelekan 2009; Idowu et al. 2011). The loss of land requires the impoverished groups in Lagos and surrounding coastal cities to reverse their rural-urban migration and move further inland again, which is expected to result in 14 million displaced peoples by 2100 (Adelekan 2009; Akpodiogaga-a and Odjugo 2010). Migration as a means of adaptation theoretically reduces the climate vulnerability that groups face by allowing them to move to areas with a greater abundance of resources, but in practice this increases the interaction between subsistence practices and other Nigerians within a reduced area (McLeman and Hunter 2010; Turner 2004). Numerous conflicts have occurred in both pastoral and horticulturalist populations, making the migrations due to climate vulnerability volatile (Ahmadu 2018). Although these conflicts have always been present within and among the different groups of Fulani, the once periodic migrations have become varied in timing and movement while also occurring with greater frequency, completely altering the way in which interactions occur and conflicts are managed and mitigated (Ahmadu 2018). Disaster and displacement associated with climate change are human security issues due to the reliance on movement to adapt to the changing conditions while also maintaining cultural orientations (Crate 2011).

The population of Nigeria is increasing in size, but also in concentration, making movements a necessary adaptive practice (Majekodunmi 2018; Swift 1977). In addition

to serving as a coping mechanism for climate change, migration is thought to be one of three possible responses to coping with an increased population (Swift 1977). Reducing the geographic distribution of the Fulani and other Nigerians, all competing for the same resources, has resulted in a shift from symbiotic relationships to aggressive competition (Buhaug et al. 2015). Without crop predictability and the availability of water and fodder for grazing cattle, both horticulturalist and pastoralist Fulani are actively moving. During the dry season, young, horticulturalist Fulani will often migrate to urban centers to find other employment opportunities (McLeman and Hunter 2010). As the length of the dry season increases and desertification encroaches on southern areas, young pastoral and horticultural Fulani, including children from each family, choose to migrate to either stay with relatives in areas that are receiving rain or to the urban areas in order to relieve some of the burden from the drought conditions that are occurring (McLeman and Hunter 2010; Ahmadu 2018). This reduces the stress placed on the Fulani community by allowing less resources to be used in one area (McLeman and Hunter 2010). However, it also increases the stress placed on the urban areas, resulting in the breakdown of infrastructure and development of urban slums which are a breeding ground for revolutionary discourses and conflict (Fasona and Omojola 2005). Unfavorable environmental conditions and climate vulnerability increase the need for sedentary Fulani to diversify their incomes and remove pressures on food and water supplies from their households, but often result in the continued insecurity of the state by spreading it to urban areas (McLeman and Hunter 2010; Fasona and Omojola 2005).

During the dry season, transhumance typically occurs at short distances from the household, just out of the affected area (Abbass 2014; Raleigh 2010; McLeman and Hunter 2010). However, increased pressures from climate change have led to the need for longer distance migrations to find suitable land (Ahmadu 2018; Batterbury and Warren 2001). Many pastoralists do not have the economic means or resources to further adapt to these changes (Buhaug et al. 2015; Akinyemi and Olyaniyan 2017). The growing monetization of land and increased privatization make it difficult for Fulani to find new grazing locations (Batterbury and Warren 2001). Longer distance migration, such as the migration to Europe, usually correlates with good harvests when economic means are improved and families can use the opportunity to alleviate their climate vulnerability (McLeman and Hunter 2010). However, few can afford these actions and instead rely on localized migrations or youth movements to urban centers (Ahmadu 2018). The reduced area available for migration and alternative practices has worked to aggravate tensions among the population that are already apparent from the structural problems.

During times of typical climate variability, some pastoralists choose to walk their animals long distances to water their cattle while others choose to move their entire camp (Adriansen 2003). This characterizes the typical transhumance mode of movement. These are the regular seasonal movements of the pastoral Fulani. Semi-sedentary Fulani also feel the effects of climate variability, as they maintain herds that they must move for water and pasture in addition to small plots for farming (Stenning 1957). The unpredictability of the availability of water and resources makes it difficult for pastoralists to determine their migration patterns. This creates a push and pull effect.

Pastoralists look for better quality land and resources, the pull effect, but when quality is lacking, this causes the push effect, or another movement (Obioha 2008; Adriansen 2003). In most cases, this is a method with which to sustain the herd as a response to the environmental pressures (Batterbury and Warren 2001). The Fulani specifically maintain Zebu cattle. It is difficult to maintain this species in the scrub fringe of the Sahara and the northern border of the Sahel, while also being unable to graze in the thick brush that characterizes the Guinea Forest (Stenning 1957). The northernmost herds feel the onset of the dry season first, moving southward, pushing other pastoralists further south until they reach the area of the Guinea Forest inhabited by the Tsetse fly and thick climax vegetation (Stenning 1957). With the limited area available for pastoralists to inhabit, they are often left to infringe upon others' land in order to find suitable pasture and water sources.

The traditional transhumance patterns that are employed for general movements are also interconnected with other methods depending on the degree of environmental change and availability of open resources. Pastoral Fulani traditionally do not maintain land rights or ownership of pasture, water, or transhumance routes, as their nomadic practices do not require permanent land areas (Stenning 1957). Modern land ownership has infringed upon this practice, as less land is public and agreed upon for common use, and farmers are more protective of their crops and resources (Batterbury and Warren 2001; Benjaminsen 2008; Fasona and Omojola 2005). Grazing land is also being reduced because of an increase in both logging and desire for cultivable land (Aigbe and Oluku 2012). Although pasture is not normally controlled by the Fulani individually, major

lineages of Fulani often have claims to certain areas that they graze in (Swift 1977). The lack of political autonomy of the pastoral population has largely undermined this idea of collective ownership (Majekodunmi 2018; Swift 1977). The absence of collective unity among the pastoral Fulani has contributed to the ability of the agricultural, settled Fulani to gain government support in their endeavors, pitting the pastoral Fulani against them and the government (Majekodunmi 2018).

As the area that pastoralists can occupy in the middle belt of Nigeria shrinks and the land is increasingly broken up into fragments by private ownership, completely new movement routes have become necessary to support a herd (Abbass 2014). These new movements include changing transhumance routes which encompass migratory drift and migration (Majekodunmi 2018; Stenning 1957). These systems are increasing in prevalence as the use of transhumance is no longer suitable to adapt to the changing conditions (Batterbury and Warren 2001). Migratory drift consists of a gradual change in the typical transhumance route and the establishment of a new camp (Stenning 1957; Adriansen 2003). The group then adopts this orbit as a new transhumance route (Stenning 1957). If neither transhumance nor migratory drift is acceptable, the Fulani will resort to migration as a coping mechanism. Although migration is often a result of catastrophic environmental changes, such as the southward progression of the desertified lands of the Sahel, or political unrest, the Fulani also include political or ideological reasons for their movement as a reason for migration (Stenning 1957; Ahmadu 2018). Today, migration is cited more as a means of coping with climate change specifically, which connects both

environmental change and political unrest under the umbrella of structural violence of the state and increasing the prevalence of migration as an adaptive strategy.

Competition over reducing resources and shrinking land has resulted in a rise in tensions when combined with the political instability of the country (Ahmadu 2018; Homer-Dixon 1994). Despite the traditional practices of cattle theft among groups of pastoral Fulani, the nomadic nature of the subsistence practice allowed them to move about the land preventing major conflicts and competition for resources (Ahmadu 2018). Conflict is not inherent in the traditional movements of the Fulani, leaving increased temperature and decreased precipitation as major causal variables in the increase in conflict. When the horticulturalist Fulani are displeased with the land that they are using, they often look to increase their yield by expanding into the more fertile central areas that the pastoral Fulani inhabit on their transhumance routes (Nyamnjoh 2013). These shifts in migration patterns to adapt to climate change have resulted in violent clashes among the migrating pastoral Fulani and the communities to which they are relocating. The violent clashes are uncharacteristic of traditional responses to typical climate variability, showing an increase in climate vulnerability among the Fulani in the current political ecology.

Farmers struggle with climate change because of their reliance on natural resources. However, they have more options for adaptation than pastoralists who are largely limited to movement as their main form of adaptation. Most farmers are small-holders and plant a combination of food and cash crops in order to sustain themselves and also produce crops for export or sale in local areas (Akano et al. 2018; Nyong, Adesina,

and Osman Elasha 2007). Despite the reliance on agriculture for economic productivity in the area, the growing season in the mid-range Sahelian and Sudano-Sahelian zones is rather short. This season lasts for around 60-120 days with some of the wetter areas of the region seeing seasons lasting for 150 days (Sivakumar 1989; Sivakumar and Wallace 1991). Shifting weather patterns due to climate change and anthropogenically intensified desertification create greater risk for even shorter growing seasons (Wittig et al. 2007). Any change in the rainfall patterns in the region, including the offset of the wet season, can have detrimental effects on the planting and growing of crops (Hopen 1958). Guinea corn was previously the main cereal crop in the lower Sudan Savanna (Fasona and Omojola 2005). This was used for both human and animal consumption, but as the climate began to change, the need for crop diversification became necessary (Fasona and Omojola 2005; Sivakumar 1989). Because more than 65% of the population is dependent on agriculture to some degree, it has become a useful adaptive mechanism to combat different environmental zones and degrees of climate change (Fasona and Omojola 2005). However, even with the diversification of crops to include millet, sorghum, groundnut, and cow peas, sorghum and millet yields are extremely susceptible to rainfall variability (Adejuwon 2005). The variability in the yield of millet, the crop many farmers began to plant in place of guinea corn, is 60% dependent on rainfall which makes consistent and predictable rainfall important to its success (Adejuwon 2005). The switch to millet contributed to an increase in tensions between farmers who rely on these crops for the economic and subsistence value, and herders who believe millet stalks are good for their cattle, leading them to graze their cattle on farmlands after the harvest (Schilling,

Scheffran, and Link 2010). This is often a point of contention between farmers and herders, debating the influence of the cattle on the land and often leading to the killing of stray animals by the farmers (Schilling, Scheffran, and Link 2010).

The conflicts that are occurring over shrinking availability of land and resources and interfering practices, such as migration routes passing through farmland, are becoming more prevalent as the middle belt region continues to shrink. This region has been shrinking since the onset of the second regime shift in 1969 and the subsequent drought that occurred. In order to cope with the drought during the 1970s, livestock density increased (Wittig et al. 2007). The increase in livestock density not only contributed to the continual strain for resources in the middle belt, but also caused changes on the landscape similar to climate change (Wittig et al. 2007). This again adds to the feedback loop, placing greater stress on the region and causing the Sudanic zone to take on a more Sahelian character (S. Nicholson 2000; P. A. O. Odjugo 2010; Wittig et al. 2007). The vegetation composition also reflects this shift, which further limits grazeable land by reducing the natural fodder that herders rely on (Wittig et al. 2007). Many of the coping mechanisms for climate change and decreased land availability increase environmental degradation (Batterbury and Warren 2001). The environmental causes at the root of the problem between farmers and herders are exacerbated by the structural problems such as social ideologies and political instability that connect the subsistence practice to conflict (Akinyemi and Olyaniyan 2017; Adewale 2005). Although this conflict is often presented as a clear dichotomy, the communal and ethnic clashes have a much more intricate causal framework (Fasona and Omojola 2005). The

autochthony that allows farmers to lay claim to the land can lead them to view themselves as the civilized, which justifies power over the uncivilized (Abubakar and Ahmed 2017; Nyamnjoh 2013). The government typically sides with landowners because they are able to contribute to the state's economy. Although the binaries are not nearly as simple as civilized and uncivilized, insider and outsider, or settler and indigene, these simplifications can help identify the general structural violence within the political ecology of Nigeria (Abbass 2014). In this case, the uncivilized are the pastoral Fulani who do not have the same connection to the land, according to the civilized horticulturalist Fulani who have a connection to the land (Nyamnjoh 2013). Marginalization among groups creates further polarization within these general ideas of conflict (Arowosegbe 2009). These dichotomies all have a side that has governmental and political support because it is seen as a group with viable livelihood practices.

Thomas Homer-Dixon championed the ecoviolence theory under the Toronto School of Environmental Scarcity and Conflicts Paradigm which shows direct causal links between resource scarcity and supply induced conflict. Despite Homer-Dixon's viewpoint, the structural violence and conflict within the Sahel does not share a direct causal link with supply-induced scarcity. Rather, environmental scarcity and conflict share a more complex relationship (Benjaminsen 2008). Many other factors are at play, including a distrust of corrupt government officials, oil exploration, government favoritism toward different economic methods, social alienation, historical context, cultural shifts to a decreasing dependence on pastoral and agricultural economies, and lack of resources and shared identity to garner collective action, among numerous others

(Moritz 2010; Buhaug et al. 2015; Fasona and Omojola 2005; Abbass 2014). These, the intermediary links between climate change and conflict, can then impact the prevalence of conflict. Although severe conflicts are occurring less frequently, less severe events due to social unrest from these factors are on the rise and can lead to more severe problems if left unaddressed by government officials (Buhaug et al. 2015; Majekodunmi 2018). The instability of the state shares a direct causal relationship with the aggravation of climate change-related problems.

Chapter IV

Conflict and Disenchantment

The occurrences of armed conflict and organized violence encompass the complex relationship between social tensions, environment, and political aspects of the state, as explained by the perspective of political ecology (Okoli and Atelhe 2014). The unequal distribution of the costs and benefits of environmental issues are attributed to the differences in these relationships (Okoli and Atelhe 2014). Conflicts and insecurity emerge from the inequality of the state, which is enhanced by the government favoring certain portions of the population. This inequality is typically based on religious or economic reasoning (Salihu 2018; Abbass 2014). Despite being a federation, the government will often support the ethnic group or identity that they most closely associate with (Wimmer, Cederman, and Min 2009). A close relationship between the government and citizens is necessary for the successful maintenance of adaptive mechanisms and institutions for handling insecurity. The negative effects stemming from resource-related conflict are also evident in developed countries when there is a failure to address systemic problems or when institutions are unable to function under the increased stresses of climate change (Tenuche and Ifatimehin 2009; Hsiang, Burke, and Miguel 2013). However, these problems are not as prevalent for developed countries because most have mechanisms in place to prevent the failure of institutions. The low income, insecure areas are typically associated with higher rates of interpersonal violence when agriculture and other subsistence practices are relied upon for livelihoods with little to no

governmental support for subsistence practicing populations (Hsiang, Burke, and Miguel 2013).

The governmental structure of Nigeria has been closely related to the continuation of insecurity because of a failure to adapt the system to the plurality of the state. The post-colonial government of Nigeria allowed indigenous leaders to maintain the structures of the colonial state (Onwuzuruigbo 2010). However, only the northern states were sympathetic to the ethnic differences of the citizens, while the eastern and western portions of the country had a stronger economic focus at the cost of their individuality (Adamolekun 2013). The largely decentralized structure during the early 1960s allowed both the federal and regional governments to contribute to law and policy with strong communication about resource allocation and funding between the two levels of government (Adamolekun 2013). However, the colonial fear that minority groups could gain power persisted, contributing to the modern discourse that minorities are not people with the same rights (Osinubi and Osinubi 2006). They become the marginalized groups out of fear, removing power from indigenous leaders and allowing the systemic problems and inequalities to grow (Wonah 2018). The onset of modernization developed a central government that maintained most of the power and saw ethnic differences as inconsequential to the success of Nigeria (Onwuzuruigbo 2010). In 1967, the federation restructured its divisions to form twelve states which in turn were restructured numerous times before reaching the final number of thirty-six states in 1996 (Adamolekun 2013). The division of states and transition to a military federalization led to the formalization of central governance and left most of the power to the federal government (Adamolekun

2013). The goal of the continued division of states was to shrink the population of the states and their economic power to ensure they could not oppose the federal government (Suberu and Diamond 2001). The central government now acts as the determining factor in allocating funding and resources to the different states, and is characterized by corruption and an unequal distribution of funding (Wonah 2018). This leaves state governments vying for funds or resources from the central government, often preventing local legislation such as anti-grazing acts from being enacted (Salihu 2018). As resources become scarce with climate change, the advantaged groups, whether by political or economic power, often allocate resources in their own favor (Suberu and Diamond 2001; Obioha 2008). The Nigerian government's corruption and lack of action in many instances due to the ethnic and religious pluralism of the state causes the prolongation of insecurity. The goal of the Nigerian federation is to give states autonomy so they can govern based on the ethnic composition of the state (Adamolekun 2013). However, the economic influence of the central government often overshadows the interests at the local level and obscures the goals of the federation (Obioha 2008). Post-colonial oil discoveries created economic hope and strong revenues for the state, shifting the focus of the central government to increasing Nigeria's economic position (Suberu and Diamond 2001; Jike 2004). Many of the laws that have been introduced as a result of the shift in economic focus directly oppose traditional laws (Obioha 2008).

The heavy focus on economy and revenue for the state contributes to the favoring of Western conceptions of economic development, which take away the importance of subsistence practicing groups (Hansen and Jonsson 2014; Jike 2004). By formalizing land

rights to reflect colonial ideas, a Western notion of land use was adopted in a way that limited the actions of traditional institutions that had previously managed it (Benjaminsen et al. 2008). Although the land tenure system that has been around since colonialism is said to be based on traditional land use systems, the way in which the system functions is based off of colonial ideas of the way in which the traditional system worked (Cotula and Cisse 2006). Therefore, it offers a skewed perspective as to how land should be allocated among different groups of people (Cotula and Cisse 2006). The land use system is biased against pastoral Fulani because of their nomadic way of life, with neither side wanting to compromise on land allocation (Abbass 2014). The Land Use Decree of 1978 followed soon after the discovery of oil and the shift in focus to economic growth, attempting to place Nigeria under a national land tenure system to remove individual ancestral ownership and land rights (Jike 2004). Given the lack of support for nomadic populations by most governments due to the thought that traditional practices prevent modernization and development, Fulani pastoralists are typically the population which is not supported by the state (Benjaminsen et al. 2008). The government assumes Fulani pastoralists are practicing an invalid livelihood, emphasizing a difference between the Fulani farmers and herders. The differences that are apparent among the Fulani become grounds for the conflict and distrust among the Fulani as they compete for reduced land and resources without conflict resolution systems.

Governmental action has been seen as insignificant in regards to the mitigation of conflict among the Fulani (Ogo-Oluwa 2017). The government often chooses not to act in cases of intra-ethnic conflict, focusing instead on other seemingly more pressing issues

(Salihu 2018). Most of the governmental action that is involved in the farmer-herder conflict is based on conflict resolution, rather than conflict prevention, if any action is taken (Obioha 2008). The continued ignorance of the presence of intra-ethnic conflict within the state and lack of response contributes to the constant buildup of tensions without resolution. The lack of concern with mediating the beginnings of unrest by the government allows these tensions to manifest themselves as conflicts that had the potential to be resolved. Between 1991 and 2005, over 50% of conflicts within Nigeria were land-related (Obioha 2008). The exacerbation of these conflicts often leads to the development of terrorist organizations such as Boko Haram (Salihu 2018). The drying up of Lake Chad and desertification of surrounding areas contributed to the unemployment of young men as the viability of subsistence based livelihoods decreased, leading to the beginnings of conflict (Abubakar and Ahmed 2017). Boko Haram began as small scale, local attacks, which the government did not originally act on because of a lack of concern for the security implications of the group (Salihu 2018). This enabled them to gain traction and enlist disillusioned people from the population to increase their reach and spread their ideology (Adesoji 2011; Salihu 2018). What began as sporadic incidents developed into an interconnected system of terrorist attacks which resulted in mass killings and other attacks on the population such as kidnapping, the raping of women and children, and the destruction of properties (Salihu 2018). Now, singular incidents are woven into a network of terrorism, with one incident in July 2017 in Jibi, Nigeria leading to the deaths of 69 people in a kidnapping, while two other major armed attacks and bombings in 2017 resulted in the deaths of over 100 people (Institute for Economics &

Peace 2018). The lack of intervention by the government has allowed these problems to grow, requiring greater military and government action to prevent the atrocities of terrorism (Salihu 2018). This has created a major problem of insecurity in Nigeria where the government is having little effect and the economic losses from damages to property are having extreme ramifications on the country.

The Fulani farmer-herder conflict is reflective of the beginning development of Boko Haram (Salihu 2018). Although the foundation for Boko Haram is based off of religious ideology and establishing a new caliphate, while the Fulani conflict is based off of the minor differences of subsistence practices, both involve climate change as an aggravator of tensions and conflict, combining social inequalities with youth restiveness and alienation to grow the conflict in size and strength (Nwaoga, Okoli, and Uroko 2017; Mustapha 2014). The Nigerian government has taken little to no precautionary measures to prevent the Fulani herder extremists, who are the traditional pastoralists, from becoming a dominant national security threat (Nwaoga, Okoli, and Uroko 2017). Many of the attempts to reduce the negative consequences of the farmer-herder conflict have been proposed by local, state-level governors, rather than the central government (Salihu 2018). The central government has remained largely quiet on the issue, allowing it to persevere unrestrained. This conflict is indirectly tied to climate change and access to resources for livelihood procurement as it was with Boko Haram. However, conflict that is causally linked to the environment is not a form of environmental determinism (LeBillon and Duffy 2018). There are many instances in which climate events do not cause conflict (Hsiang, Burke, and Miguel 2013). The existence of climate change is

instead exacerbating already existent structural problems within the given area, not determining the outcome. Given the prevalence of religious, ethnic, or other ideological issues within Nigeria, the negative effects of climate change on present issues are resulting in human insecurity.

Many countries feel the negative effects of climate change, but are able to cope because of economic status, adaptive mechanisms, and government support (Hsiang, Burke, and Miguel 2013). These events are played out globally in any areas where climate change is affecting the inhabitants of an area and where groups are marginalized or seen as politically irrelevant (Onwuzuruigbo 2010; Raleigh 2010). Often, the groups that are fighting are similar in many aspects including language and religion, but vary in terms of economic practices (Kolstø 2007). As Sigmund Freud posited, the "narcissism of minor differences" can be a cause of ethnic conflict. This concept is not an explanatory theory. However, portions of the narcissism of minor differences can help explain ethnic conflict when they are socially and politically activated, and there are already problems with status and economic access (Kolstø 2007). This can prove to be especially problematic because ethnic identities are fluid and constantly being constructed and modified, making it difficult to identify the similarities and differences between ethnic groups, especially in marginal environments (Osinubi and Osinubi 2006). Just as ethnicity can act as a means for maintaining cohesion, it can also act as a polarizing force when groups struggle for autonomy or ways in which to preserve their livelihoods (Kolstø 2007; Osinubi and Osinubi 2006). Cohesion and alienation are both factors in the development of conflict, insurgencies, and terrorism because discontent can lead to the

breakdown of social structures that either directly or indirectly help maintain peace and security (Keita 1998; Institute for Economics & Peace 2018). Since 2015, Nigeria has been the third highest rated group in the Global Terrorism Index for its impact of terrorism, placing higher than Syria (Institute for Economics & Peace 2018). The Global Terrorism Index is a report that summarizes global trends in terrorism to improve the understanding of terrorism and its impacts, utilizing terrorist attacks in a five year time frame to include the physical act and its psychological effects (Institute for Economics & Peace 2018). The Institute for Economics & Peace defines terrorism as "the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation." The higher a country is rated, the more volatile and insecure it is. Despite an overall decline in terrorist attacks and fatalities since 2014, especially from Boko Haram, numerous groups including Fulani extremists have seen an upsurge in terrorism (Institute for Economics & Peace 2018). The actions of these groups are still contributing to the country's rating as one of the top ten countries most affected by terrorism. The nation has also made the top twenty most fatal terrorist incidents list because of incidents caused by both Fulani extremists and Boko Haram. Fulani extremists have been classified on the top twenty most fatal terrorist attacks list since 2014, with the exception of 2015 when most of the top attacks took place in the Middle East. However, the Fulani extremist attack in the state of Benue resulted in more deaths than that of Boko Haram in the list of top fatal incidents in 2018. In total, the actions of Fulani extremists have resulted in six times more civilian deaths than Boko Haram in 2018 (Institute for Economics & Peace 2018). As Boko Haram's

influence has decreased, Fulani extremists have become the dominant group responsible for contributing to terrorism in Nigeria. These terrorist acts are derived from the insecurity of Nigeria and the structural problems that are present within the country. The changes in terrorist acts from the large-scale acts of Boko Haram to the small-scale, individual incidents of Fulani extremists has made actions unpredictable and spread the potential area where these attacks can occur. As the smaller segments of the population who have less support and visibility within the state increase their acts of terrorism to a point that contributes to more insecurity than Boko Haram, the lack of government support and global awareness of the issues allows the insecurity to increase further. The state's unresponsiveness to structural problems can increase public salience of these issues, which leads citizens to band together and take action, while alienation from the state can propel disillusioned youths to act (Ogo-Oluwa 2017; Jike 2004). Economic deprivation leads young people, primarily males, to resort to rebellion or turn to fundamentalist groups for support (Adesoji 2011). Grievances about inequalities can be directed at the state, at the culprits of inequalities, or at others within the ethnic group. Competition for material resources is often considered to be an important factor in determining if minor differences will cause aggression to be directed at outsiders (Kolstø 2007). Since the causal factors in conflict do not necessarily result in the same outcome, it is often the structural problems, such as a competition for resources, that contribute to the disenchantment of peoples and the breakdown of cohesion which causes the differences between people to become more apparent. The degree of disenchantment with

the system and the length of time in which grievances are not dealt with can indicate the degree of retaliation from the afflicted group onto the afflicters.

A failure to address systemic problems in combination with environmental stress creates the same push and pull phenomenon that is experienced by the Fulani. While different factors push the people away from their typical residence, other factors that promise better opportunity pull them toward a new area. Many pastoral Fulani in Nasarawa State in the north-central region of Nigeria are pushed by the attempts of settled farmers to displace or marginalize the herders from the middle belt region which contains a large amount of arable land (Okoli and Atelhe 2014). The pastoral Fulani in Ekiti State faced a similar push by farmers within the middle belt region who utilize irrigation to increase the growing season, leaving the pastoralists to change transhumance patterns further toward the coastal region (Ogo-Oluwa 2017). The multitude of factors stemming from climate change and structural violence within the country contribute to this need for migration among communities (Folami and Folami 2013). At its core, the economic problems stemming from environmental degradation and resource access and availability are manifested in the movement of peoples across the state (Benjaminsen 2008; Folami and Folami 2013). The increase of movement and influx of people into new areas then results in similar problems where concentrations of people become too high, and identities become broken down with little to no means of maintaining cohesion to resolve problems (Okoli and Atelhe 2014). Once cohesion among minority groups is broken down, it is even more difficult for them to gain political support. The collapse of the traditional family network and its values in conjunction with the already high levels

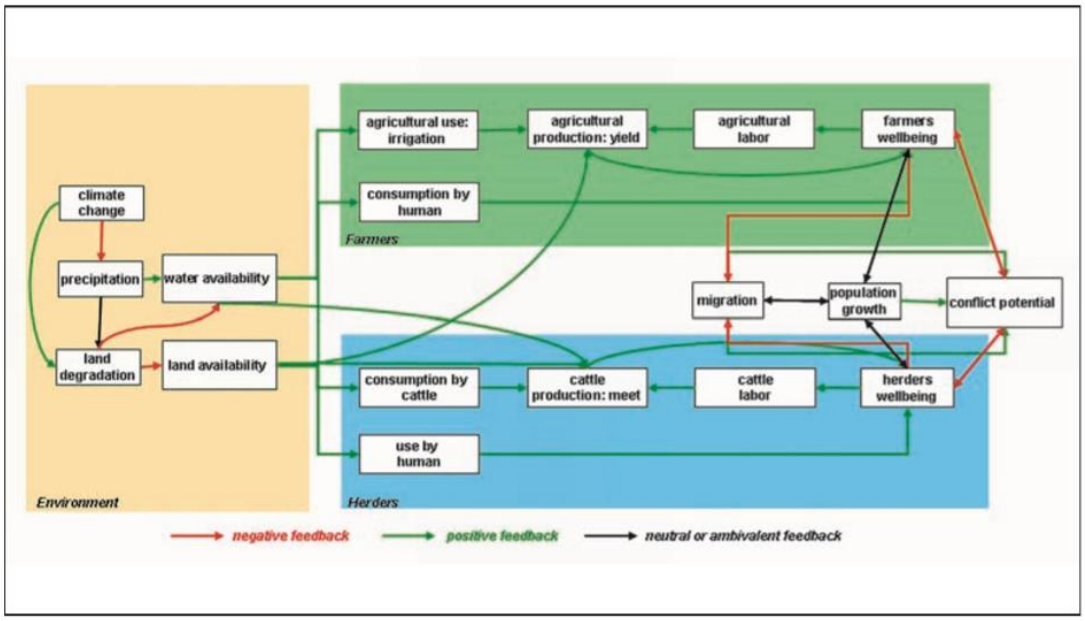
of unemployment and exclusion from the state makes the minority groups increasingly susceptible to conflict (Jike 2004; Okoli and Atelhe 2014). Despite there being no government support for traditional practices and therefore no means of maintaining traditional mechanisms of cohesion, President Obasanjo remarked in 1999 and 2000 on the importance of maintaining a traditional power structure within ethnic groups (Jike 2004). Prior to climate-induced migrations, the cohesive nature of these marginalized groups allowed them to act as a unit in their local context, giving them some autonomy and political voice in larger issues. The politically irrelevant become the target of the grievances of host communities because the traditional institutions that maintained peace had been disrupted. The government also took advantage of the nomadic populations' lack of cohesion and could impose control on them (Odoemene 2011). State borders were previously defined in a way that was meant to keep ethnic groups together (Adamolekun 2013). However, given the pluralistic composition of Nigeria and the continuously moving populations, the attempts did not succeed. The similarities between different groups often made it nearly impossible to differentiate between these groups without external consideration. The minor differences between the Hutu and Tutsi of Rwanda were not noticeable to even the groups themselves, only to outsiders who assumed rigid ethnic identities (Kolstø 2007). The Rwandan Genocide was one such manifestation of the conflict over resources and identity (Onwuzuruigbo 2010; Osinubi and Osinubi 2006). The variation in economic practice and competition for resources created a way in which the tensions of the externally defined minor differences could manifest themselves within the population, especially if these groups were deemed politically irrelevant

(Wimmer, Cederman, and Min 2009; Kolstø 2007). Many of the colonial policies stemming from religious and ethnic differences are still present in the way land disputes are dealt with (Batterbury and Warren 2001).

The way in which land use and resource access issues are dealt with vary from community to community, but many are still based on modern land use management, rather than the traditional methods farmers and herders had to resolve their own conflicts. Modern governance and politics have largely interrupted the traditional conflict resolution mechanisms and institutions within smaller segments of the population (Odoemene 2011). National, large-scale governance has left many communities without any actors to represent the group, making them politically irrelevant (Wimmer, Cederman, and Min 2009). Problems with local politics and governance also create problems among ethnic groups within the state. The government's desire for cash crops that bring in high revenues often leave no crop remains for herders to use as fodder for their cattle and limit when herders graze their cattle (Ogo-Oluwa 2017). Typically, herders are only able to graze during certain daytime hours on public lands. Ekiti state passed a law banning grazing between the hours of 6pm to 7am in order to restrict the use of land, imposing fines for any herders who disobey the law (Ogo-Oluwa 2017). It is projected that rain-fed crop yields will decrease by as much 50% by 2020, making farmers even more protective over their crops (Akano et al. 2018). The different capacities of people to adapt to the changing climate is both a result of climate variability and social change (Batterbury and Warren 2001). Many government officials are corrupt and side with only one ethnic group in the population for economic or political reasons,

creating disenchantment among citizens (Wonah 2018). Issues of structural violence are directly related to these problems of corruption and are one way in which inequalities of the state are manifested (Wonah 2018). The lack of governmental action has led to a breakdown of institutional structures, further contributing to the lack of adaptive capacity of the state (Jike 2004). Without any mechanisms to counter the major economic problems and inequalities that are present, the subsistence practicing populations bear the greatest costs.

Many other populations across the world are affected similarly by problems of structural violence, especially those who share the same farmer-herder social structure as



the Fulani. Although the outcomes of structural violence can be different depending on

Figure 4.1: Model of positive, negative, and neutral feedback among farmers, herders, and the environment. Source: Schilling, Janpeter, Jürgen Scheffran, and Michael P Link. 2010. "Climate Change and Land Use Conflicts in Northern Africa." Nova Acta Leopoldina NF, 10.

the political ecology of the area, the possibility of conflict is still high. Schilling et al. developed a model of positive and negative feedback to show the relationship between farmer-herder conflicts and the complexity of inputs, outputs, and relative interaction

among their livelihoods. Figure 4.1 shows the similar adaptive mechanisms for both farmers and herders. In instances of climate change, or reduced water or land availability, both cause positive feedback which can lead to the negative feedback of migration or the potential for conflict in order to minimize changes. However, the negative feedback of migration could be avoided by an increase in farmers' and herders' wellbeing. Positive feedbacks increase the effects of change while negative feedbacks work to reduce the effect. Within the different aspects of the causal feedback chain, there are differences among farmers and herders. Access to resources is an extremely important feature for both subsistence practices, though the pastoralists typically bear greater stresses in accessing these resources because of the structure of land use (Benjaminsen et al. 2008). Historically, pastoralists were able to water their livestock at waterholes year round for free (Beeler 2006). However, major droughts throughout Africa led to different host communities establishing a system for pastoralists to pay for access to waterholes (Beeler 2006). Prices for access to waterholes are also dependent on the annual rainfall. During times when rainfall is lower, prices for access are much higher than wet years (Beeler 2006). The ability to access resources, especially under the relatively peaceful methods of traditional institutions, is extremely important for preserving livelihoods and human security.

The Fulani are not the only subsistence practicing population which faces farmer-herder conflicts. This has been reflected in the different ethnic groups in northern Mali. Mali is comprised of numerous different ethnic groups, similar to the plural composition of Nigeria. The two majority populations are the Manding, a group of farmers who

account for around half of the state population and the Fulani, who practice a hybrid of cattle herding and sedentary farming in this region (Schilling, Scheffran, and Link 2010). There are numerous smaller ethnic groups that each comprise less than 10% of the population and practice sedentary farming (Schilling, Scheffran, and Link 2010). Tuareg and Maur herders are then the smallest minority groups comprising around 5-10% of the population of Mali (Schilling, Scheffran, and Link 2010; Tanchum 2012). However, the Tuareg occupy around 66% of the land of Mali, mainly in desert and semi-desert areas that are not seen as usable by the majority of Malian citizens (Tanchum 2012). The desert and semi-desert areas cannot support rain-fed agriculture, which means the Northern Sahel has a greater advantage for nomadic pastoralists than farmers (Benjaminsen 2008; Folami and Folami 2013). These minority groups, including the Tuareg, are treated as the politically irrelevant because of both their size and subsistence practice, which is correlated with the events of the 1990-1996 Tuareg Rebellion and the Tuareg Separatist Rebellion of 2012 (Benjaminsen 2008; Tanchum 2012). Within Northwestern Mali where the Tuareg Rebellion took place, the Soninké are the politically and numerically dominant group (Beeler 2006). In this area, the allocation of resources and the infringement on other land is often a point of contention. After the regime shift and major droughts of the 1970s and 1980s took place, herders began having to pay for the access to water in order to maintain enough stores for the sedentary villagers (Crane, Roncoli, and Hoogenboom 2011; Beeler 2006). Even when the rains returned in the 1990s and 2000s, the rain was not equivalent to the level prior to the original droughts, leading to a continuation of the conflict over water access and allocation (Crane, Roncoli, and

Hoogenboom 2011). Similar to the migration that the Fulani must employ to find suitable land, the environmental changes in Mali led to the migration of young men to neighboring states (Benjaminsen 2008). It is this migration, undertaken in search of economic opportunity under the influence of drought and poor environmental conditions, that leads to the exposure of young men to revolutionary and fundamentalist discourses (Benjaminsen 2008).

Nigeria and Mali are similar in terms of ethnic composition, social and religious pluralism, and subsistence practices. The poor definition of a national identity contributes to feelings of alienation and disenchantment when the indigenous, subsistence practicing groups become marginalized after the adoption of other economic focuses (Adesoji 2011). After gaining independence, Mali similarly experienced a period of time where the government tried to balance traditional and colonial policies, largely favoring the economically beneficial parts of the population (Keita 1998). The two nations are also directly linked through certain ethnic groups, such as the Fulani, and the presence of fundamentalist groups such as Boko Haram (Tanchum 2012). Boko Haram's discourse has been able to spread throughout this region because of the span of the nomadic populations (Tanchum 2012). Although the alienated populations often take matters into their own hands as is the case with the Fulani extremists and the Tuareg Rebellions, other disillusioned Fulani and Tuareg have become connected with Jihadist groups (Institute for Economics & Peace 2018). The Jihadist groups offer protection against the state which provides an opportunity for recruitment, capitalizing on their ideological movements (Institute for Economics & Peace 2018).

Although conflict has been decreasing globally since 2014, it is still on the rise in certain areas including the Sahel (Institute for Economics & Peace 2018). Mali and Nigeria have both seen a resurgence of conflict within the past year where pastoral disenchantment is manifesting itself in armed conflict. Despite deaths from Boko Haram falling within this time period, the occurrence of violent conflict for Fulani extremists has increased drastically (Institute for Economics & Peace 2018). Boko Haram's actions have drawn more attention due to the scale and geographic distribution into other states, removing the focus from the intra-state Fulani violence. However, Fulani herdsmen-related violence has resulted the deaths of over 60,000 people since 2001 according to the US Department of Defense's Africa Center for Strategic Studies. As opposed to Boko Haram, this violence is less about ideology and more about access to resources and the ability to continue subsistence practicing livelihoods to meet basic needs (Mustapha 2014). It is mainly a question of economics and livelihood preservation, rather than religion and ideology. The violent acts of Fulani herdsmen are reminiscent of the events of Boko Haram as both groups' actions fit the definition of terrorism (Salihu 2018). The current attacks are focused on terror and violence, whereas the conflicts that occurred around the time of colonialism in the 1960s were on a much smaller scale and were singular incidents (Salihu 2018). However, not all Fulani herdsmen take part in acts of terrorism. Fulani herdsmen are divided into the armed and unarmed herders (Salihu 2018). The armed Fulani herdsmen are considered to be the Fulani extremists who resort to acts of violence as a means of expressing their grievances (Wimmer, Cederman, and Min 2009; Osinubi and Osinubi 2006). Conflicts have become more violent with the

availability and accessibility of weaponry (Raleigh 2010). Whereas the Fulani previously carried small weapons such as arrows and daggers to protect themselves and their cattle from animals and cattle rustlers, they have now taken up modern arms, employing AK-47s and grenades to use against farmers during conflict (Abbass 2014; Salihu 2018; Majekodunmi 2018). These arms are obtained from the conflict areas in the northern states, including the Niger Delta region where Boko Haram is concentrated. The Fulani extremists who have taken up arms have contributed to a country-wide fear of the Fulani as a whole, whether armed or unarmed (Salihu 2018). The farmers have taken it upon themselves to retaliate against the acts of the pastoralists, poisoning the land cattle graze on and watering holes they drink from (Abbass 2014). Some farmers have even planted crops that are poisonous for the cattle to consume to discourage pastoralists from trespassing on the farmlands (Salihu 2018).

Chapter V

Conclusion

The complex connection between post-colonial influences on identity, politics, and subsistence, in combination with climate change are creating a hospitable environment in Nigeria for increased conflict which could ultimately lead to a greater occurrence of terrorism. Many of the more recent farmer-herder conflicts are beginning to be classified as acts of terrorism as they are often targeting unarmed civilians as a display of power and manifestation of their grievances (Salihu 2018). The uncertainty and unpredictability of climate change is not a question of whether there will be adverse effects globally, but a question of how severe the impacts of these changes will be (Huntjens and Nachbar 2015). Although Western countries can choose to ignore the early effects of climate change by postponing them with economic inputs and technological fixes, the Sahel is unable to do so due to the structural problems that are apparent, including government corruption, lack of infrastructure, and a poor economy. The effects of climate change are amplified within the Sahel because of its geographic location and political ecology, making climate change a much more pressing issue. The connection between climate change and conflict is not linear. There are numerous different indirect causal links which can influence social interactions as a consequence of climate change. When the effects of climate change are manifested within an already disadvantaged population, the likelihood of conflict increases. The farmer-herder conflicts within Nigeria have become much more than just the small-scale intra-ethnic conflicts that

previously occurred. They are driven by the complex relationship between environmental changes and structural problems within the current political ecology of Nigeria. This is an issue of human security given the delicate balance between maintaining traditional livelihoods and cohesion, and the chance for conflict to result from disenchantment with and alienation from society. Similar to structural violence, insecurity inhibits populations from meeting basic needs and reaching their potential (Okoli and Atelhe 2014). Climate change is threatening the lives, livelihoods, and general security of billions of people globally. The disproportionate effects of climate change contribute to the idea that climate change is a threat multiplier, meaning that it will aggravate already existent problems among populations (Huntjens and Nachbar 2015). The problem manifests itself unequally among different populations, making it a global environmental justice issue. Periods of anomie contribute to societal breakdown and lead people to act on their own to gain a sense of belonging and a purpose which often results in the adoption of radical ideas (Odoemene 2011). Social movements such as these are unrestrained by the society during periods of anomie and are then able to grow while the already existent problems continue to increase in scope and severity. Nigeria has been unable to meet the Millennium Development goals because of problems of insecurity such as unemployment, a lack of food security, and the poor socioeconomic standing of many citizens (Thelma 2015). These goals are aimed at reducing poverty and improving the lives of impoverished individuals (Thelma 2015). However, these problems have persisted within Nigeria, contributing to the overall insecurity of the nation while conflict has prevented further measures from being taken to attain these goals (Nwaoga, Okoli,

and Uroko 2017; Thelma 2015). The perseverance of insecurity from the root historical, political, social and environmental problems within Nigeria is presenting a developmental challenge for the state because of the incessant conflict. The mechanisms that are necessary to resolve current issues and prevent future conflict from occurring are not implemented in a way that allows them to adequately handle the state problems and global climate change. The complexity of the issues causing conflict requires an equally complex solution to target all of the systemic problems to reduce overall insecurity and feelings of disenchantment that cause social movements to develop. In some instances, social movements can be positive. However, in the case of the Fulani, social movements result in an increase in revolutionary and fundamentalist discourses that utilize terror to attain their goals. A reduction in social inequalities could help to prevent the development of social movements by increasing the ability of individuals to adapt to the changing climate or introducing domestic and global mitigation strategies that will enable groups to continue using their traditional mechanisms for coping with natural climate variability.

In order to abate these issues, a reframing of the discourse around climate change is necessary for a global redefinition of human security and the way in which this problem is not limited to third world or "undeveloped" countries. Although the areas in which climate change is having stronger affects are typically economically disadvantaged and politically young states, the insecurity that is resulting has both domestic and global implications. Migration is not limited to intrastate movements as shown under the auspices of the Internal Displacement Monitoring Center. The pressures forcing groups to migrate both in state and out of state spread the chance of conflict from Nigeria to Europe

and anywhere in between. Conflict and violence have caused over 417,000 people in Nigeria to be internally displaced between January and June of 2018, resulting in a large influx of refugees into neighboring areas (Internal Displacement Monitoring Centre 2018a). Of these displaced people, 217,000 were displaced due to conflict and violence associated with Boko Haram, with the rest being due to Fulani farmer-herder conflict (Internal Displacement Monitoring Centre 2018b). The issue of Boko Haram is publicized to a greater capacity than the Fulani farmer-herder conflict, despite contributing to about half of the internal displacements in Nigeria. While the number of internally displaced peoples and deaths have decreased for Boko Haram, both are increasing in association with the Fulani conflict. In 2017, the conflict between farmers and herders was thought to have produced around 80,000 displaced peoples within Nigeria, resulting in a more than twofold increase in the number of displaced peoples in 2018 (Internal Displacement Monitoring Centre 2018b). The drastic rise in internally displaced peoples as well as conflict is creating a human security problem that has largely been ignored and overshadowed by Boko Haram. Beyond the conflict-related displacements is the inability of Nigeria's centralized government to prevent and resolve conflicts because of the inherent inequality in the governmental system (Okoli and Atelhe 2014). Although oil wealth contributes to a large portion of Nigeria's modern economy, subsistence practices are still Africa's largest sector for labor opportunities and livelihood, despite only making up about 20% of Nigeria's GDP (Buhaug et al. 2015; Ikenwa, Sulaimon, and Kuye 2017). The disruption of Nigeria's economy because of climate change exacerbates the problems of poverty and disproportionately affects those

practicing subsistence livelihoods. Although other portions of the population are negatively affected by climate change, because subsistence practices are related to natural resources at the closest level, it is those populations that are required to adapt to the changes first. The competition for resources due to displacement from environmental and social problems has created an agrarian migration and an inherent competition over land and resources (Okoli and Atelhe 2014).

Over 60% of pastoral Fulani conflicts occur during the dry season (Abbass 2014). The increase in temperature and decrease in rainfall is contributing to the continuation of this trend in conflicts. A lack of mitigation of the effects of climate change is creating a system in which inequalities in the access to resources are becoming economically and politically charged as the livelihoods of subsistence practicing individuals are being dismantled. Urban migration does not provide a viable option as an alternative to subsistence practices because of the prevalence of unemployment in urban areas. This then ties back to the idea of youth restiveness and the disenchantment with society that leads to the creation of social movements that often become radicalized and take up arms. If youths who leave their social group in search of employment opportunities cannot find employment, they have free time in an a densely populated area where there are no traditional institutions to keep people in line, which allows radical and fundamental ideologies to rapidly spread through the population. For these young men, it often seems that they do not have any options other than rebellion against those who are inhibiting their families from practicing their livelihoods. In times of desperation, when pastoralists

can no longer support their herd, the threat to pastoralists' identity and economic sustainability, acts as a propulsive force for accepting these radical ideologies.

The difficulty with issues related to human security in the Sahel region of western sub-Sahara Africa is that they are framed through Western conceptions. Africa is a continent that is often perceived as a dichotomy. It is either shown negatively, rampant with ideas of war, conflict, and famine, or naively portrayed with mystic ideas that display Africans as inhuman. These two opposing discourses come from external, Western sources who are uninformed or ignorant of the history of the continent, its present day situations, and the different ethnic groups' own agency and identity. This projection of Western ideas then distorts the global view of the continent and ethnic groups who inhabit it. Western ethnocentrism frequently causes Africa to be viewed as a place in need of help and saving. Instead of focusing on the historical processes that formed present day Africa, including Western colonization, Western culture is taught to impose themselves on the development of the continent because Africa does not follow Western ideology and systems. Africa is framed negatively because of a lack of knowledge in regard to the historic colonialism and international influence that divided and shaped the continent. This therefore transformed African identity from what it was prior to colonialism and superimposed Western ideology on African identity. When Africa is compared to advanced or advantaged Western nations by outsiders and many anthropologists, their ethnocentrism or misinterpretation portrays it as a continent that is incapable of overcoming conflict, political corruption, and social inequality. However, the West is largely removed from these problems as Western countries are economically

and politically advantaged and therefore capable of adapting to and mitigating to climate change problems, the leading causes of conflict and inequality within Africa. It is easy to frame these problems as intra-ethnic or political, placing the entirety of the blame on African countries. Africa cannot be viewed through this incorrect Western lens if one is to truly understand its discourse and agency, as well as the ethnic identity that is historically present and has developed throughout time. The West has not only influenced the formation of Africa through colonialism, but has also been the largest contributor to the climate change that is creating drastic problems for human security within the continent as a whole as well as specific nations such as Nigeria. Africa contributes minimally to the global climate change that is occurring, yet the continent experiences most of its negative effects given its geographic and environmental location. Western ideology and ethnocentrism also play a part in putting forward the idea that modernization, especially in terms of economics and land use, is necessary to the development of the country. The effect of climate change on the Fulani is connected to this struggle to balance external, Western pressures with their traditional, subsistence livelihoods. The Fulani experience such a close connection between identity and the environment that a change in the environment will disrupt the entire system of traditional institutions and cause conflict. In the case of Nigeria, this leads some citizens to change their identity and adopt oil exploration and drilling while switching to cash crop agriculture, rather than continuing small scale subsistence farming. The changes in identity that many Nigerians find necessary to cope with climate change weaken the cohesive system and reduce human security as peoples move about the country with little

economic means or kinship network. Nigeria's human security problems are not a direct result of being an underdeveloped country, rather it is a result of the Western reorganization of Africa via colonialism and the subsequent changes in identity, socioeconomic restructuring, and political changes under the influence of climate change that is contributing to conflict and insecurity within the country. The multifaceted causal factors of identity, climate change, and structural violence that developed after Nigeria gained independence now make it difficult for subsistence-practicing Fulani to maintain their traditional practices, compromising human security. Climate change alone is not sufficient to create the conflict that is occurring in Nigeria. Understanding the connections between climate change, human security, and conflict are necessary for determining the indirect causal links in intra-ethnic conflict that cause so much devastation within Nigeria. This is not an issue that can be simplified to just a farmer versus herder dichotomy. The Fulani conflict must be examined holistically, using historical and modern developments to understand the failures of Nigerian institutions in maintaining human security and preventing conflict. The failure of the Nigerian government and international groups to act on this conflict without taking into consideration the complexity of its causes will result in the continuation of the farmer-herder disputes and an increase in human insecurity. Sustainable peace will not be achieved without the examination of the influences of climate change on identity and human security through a political ecology approach that explores the complex causal network holistically in order to inform domestic and international policy.

Bibliography

Abaje, I.B., B.A. Sawa, and O.F. Ati. 2014. “Climate Variability and Change, Impacts and Adaptation Strategies in Dutsin-Ma Local Government Area of Katsina State, Nigeria.” *Journal of Geography and Geology* 6 (2): 103. https://doi.org/10.5539/jgg.v6n2p103.

Abbass, Isah Mohammed. 2014. “NO RETREAT NO SURRENDER CONFLICT FOR SURVIVAL BETWEEN FULANI PASTORALISTS AND FARMERS IN NORTHERN NIGERIA.” *European Scientific Journal, ESJ* 8 (1). https://eujournal.org/index.php/esj/article/view/4618.

Abiodun, Babatunde J, Kamoru A Lawal, Ayobami T Salami, and Abayomi A Abatan. 2013. “Potential Influences of Global Warming on Future Climate and Extreme Events in Nigeria.” *Regional Environmental Change* 13 (3): 477–91. https://doi.org/10.1007/s10113-012-0381-7.

Abubakar, U. A., and A. Ahmed. 2017. “Climate Change and Insecurity: An Examination of Gombe State’s Predicament in the Northeastern Nigeria.” In *Global Changes and Natural Disaster Management: Geo-Information Technologies*, edited by Saied Pirasteh and Jonathan Li, 131–39. Springer International Publishing.

Adamolekun, Taiye. 2013. “A Historical Perspective in the Christian-Muslim Relations in Nigeria since 1914.” *Journal of Arts and Humanities, Vol 2, Iss 5, Pp 59-66 (2013)*, no. 5: 59.

Adebayo, A. G. 1991. “Of Man and Cattle: A Reconsideration of the Traditions of Origin of Pastoral Fulani of Nigeria.” *History in Africa* 18: 1–21. https://doi.org/10.2307/3172050.

Adejuwon, Jo. 2005. “Food Crop Production in Nigeria. I. Present Effects of Climate Variability.” *Climate Research* 30: 53–60. https://doi.org/10.3354/cr030053.

Adelekan, Ibidun O. 2009. “VULNERABILITY OF POOR URBAN COASTAL COMMUNITIES TO CLIMATE CHANGE IN LAGOS, NIGERIA,” 18.

Adesoji, Abimbola O. 2011. “Between Maitatsine and Boko Haram: Islamic Fundamentalism and the Response of the Nigerian State.” *Africa Today; Bloomington* 57 (4): 98-119,136.

Adewale, J. Gbemiga. 2005. “Socio-Economic Factors Associated with Urban-Rural Migration in Nigeria: A Case Study of Oyo State, Nigeria.” *Journal of Human Ecology* 17 (1): 13–16. https://doi.org/10.1080/09709274.2005.11905752.

Adriansen, Hanne. 2003. *The Use and Perception of Mobility among Senegalese Fulani : New Approaches to Pastoral Mobility*. Copenhagen: Centre for Development Research.

Ahmadu, Hamman Jumba. 2018. “Analysis on Some Causes and Consequences of North-South Migration of Fulani Pastoralists in Nigeria.” *International Journal of Innovative Research and Development* 7 (3). http://www.ijird.com/index.php/ijird/article/view/122853.

Aigbe, H. I., and S. O. Oluku. 2012. “Depleting Forest Resources of Nigeria and Its Impact on Climate.” *Journal of Agriculture and Social Research (JASR)* 12 (2): 1-6–6.

Akano, Oreoluwa, Sinah Modirwa, Azeez Yusuf, and Oladimeji Oladele. 2018. “Making Smallholder Farming Systems in Nigeria Sustainable and Climate Smart.” *Policy and Practice,* 19.

Akinsanola, A.a., and K.o. Ogunjobi. 2014. “Analysis of Rainfall and Temperature Variability over Nigeria.” *Global Journal of Human-Social Science Research*, June. https://socialscienceresearch.org/index.php/GJHSS/article/view/1026.

Akinyemi, Temitope Edward, and Azeez Olyaniyan. 2017. “Nigeria: Climate War. Migratory Adaptation and Farmer-Herder Conflicts.” *Conflict Studies Quarterly*, no. 21 (October): 3.

Akpodiogaga, Peter, and Odjugo Ovuyovwiroye. 2010. “General Overview of Climate Change Impacts in Nigeria.” *J Hum Ecol* 29 (January): 47–55. https://doi.org/10.1080/09709274.2010.11906248.

Akpodiogaga-a, Peter, and Ovuyovwiroye Odjugo. 2010. “General Overview of Climate Change Impacts in Nigeria.” *Journal of Human Ecology* 29 (1): 47–55. https://doi.org/10.1080/09709274.2010.11906248.

Arowosegbe, Jeremiah O. 2009. “Violence and National Development in Nigeria: The Political Economy of Youth Restiveness in the Niger Delta.” *Review of African Political Economy* 36 (122): 575–94. https://doi.org/10.1080/03056240903346178.

Bader, J., and M. Latif. 2003. “The Impact of Decadal-Scale Indian Ocean Sea Surface Temperature Anomalies on Sahelian Rainfall and the North Atlantic Oscillation.” *Geophysical Research Letters* 30 (22). https://doi.org/10.1029/2003GL018426.

Bassett, Thomas J., and Matthew D. Turner. 2007. “Sudden Shift or Migratory Drift? FulBe Herd Movements to the Sudano-Guinean Region of West Africa.” *Human Ecology* 35 (1): 33–49. https://doi.org/10.1007/s10745-006-9067-4.

Batterbury, Simon, and Andrew Warren. 2001. “The African Sahel 25 Years after the Great Drought: Assessing Progress and Moving towards New Agendas and Approaches.” *Global Environmental Change*, The African Sahel, 11 (1): 1–8. https://doi.org/10.1016/S0959-3780(00)00040-6.

Beeler, Sabrina. 2006. “Conflicts between Farmers and Herders in North-Western Mali.” *International Institute for Environment and Development*, Drylands Issue Paper 141, , 40.

Benjaminsen, Tor A. 2008. “Does Supply-Induced Scarcity Drive Violent Conflicts in the African Sahel? The Case of the Tuareg Rebellion in Northern Mali.” *Journal of Peace Research* 45 (6): 819–36. https://doi.org/10.1177/0022343308096158.

Benjaminsen, Tor A., Stein Holden, Christian Lund, and Espen Sjaastad. 2008. “Formalisation of Land Rights: Some Empirical Evidence from Mali, Niger and South Africa.” *Land Use Policy* 26 (1): 28–35. https://doi.org/10.1016/j.landusepol.2008.07.003.

Benjaminsen, Tor A., Faustin P. Maganga, and Jumanne Moshi Abdallah. 2009. “The Kilosa Killings: Political Ecology of a Farmer–Herder Conflict in Tanzania.”

Development and Change 40 (3): 423–45. https://doi.org/10.1111/j.1467-7660.2009.01558.x.

Blench, Roger. 1994. "The Expansion and Adaptation of Fulbe Pastoralism to Subhumid and Humid Conditions in Nigeria (L'expansion et l'adaptation Du Pastoralisme Peul Aux Conditions Climatiques Humides et Subhumides Du Nigeria)." *Cahiers d'Études Africaines* 34 (133/135): 197–212.

Buhaug, Halvard, Tor A Benjaminsen, Espen Sjaastad, and Ole Magnus Theisen. 2015. "Climate Variability, Food Production Shocks, and Violent Conflict in Sub-Saharan Africa." *Environmental Research Letters* 10 (12): 125015. https://doi.org/10.1088/1748-9326/10/12/125015.

Cotula, Lorenzo, and Salmana Cisse. 2006. "Changes in Customary Resource Tenure Systems in the Inner Niger Delta, Mali." *Journal of Legal Pluralism and Unofficial Law* 52: 1–30.

Crane, T.A., C. Roncoli, and G. Hoogenboom. 2011. "Adaptation to Climate Change and Climate Variability: The Importance of Understanding Agriculture as Performance." *NJAS - Wageningen Journal of Life Sciences* 57 (3–4): 179–85. https://doi.org/10.1016/j.njas.2010.11.002.

Crate, Susan A. 2011. "Climate and Culture: Anthropology in the Era of Contemporary Climate Change." *Annual Review of Anthropology* 40 (1): 175–94. https://doi.org/10.1146/annurev.anthro.012809.104925.

Farmer, Paul. 2004. "An Anthropology of Structural Violence." *Current Anthropology* 45 (3): 305–25. https://doi.org/10.1086/382250.

Fasona, Mayowa J, and AS Omojola. 2005. “Climate Change, Human Security and Communal Clashes in Nigeria.” *Unpublished*. https://doi.org/10.13140/2.1.2218.5928.

Folami, Olakunle Michael, and Adejoke Olubimpe Folami. 2013. “Climate Change and Inter-Ethnic Conflict in Nigeria.” *Peace Review* 25 (1): 104–10. https://doi.org/10.1080/10402659.2013.759783.

Foley, Jonathan A., Michael T. Coe, Marten Scheffer, and Guiling Wang. 2003. “Regime Shifts in the Sahara and Sahel: Interactions between Ecological and Climatic Systems in Northern Africa.” *Ecosystems* 6 (6): 524–39.

Food and Agriculture Organization of the United Nations. 2014. “Global Forest Resources Assessment 2015: Country Report: Nigeria.” Rome.

Fox, P., J. Rockström, and J. Barron. 2005. “Risk Analysis and Economic Viability of Water Harvesting for Supplemental Irrigation in Semi-Arid Burkina Faso and Kenya.” *Agricultural Systems* 83 (3): 231–50. https://doi.org/10.1016/j.agsy.2004.04.002.

Getz, Trevor R. 2013. *Cosmopolitan Africa, 1700-1875*. African World Histories. New York: Oxford University Press.

Hansen, Peo, and Stefan Jonsson. 2014. “Another Colonialism: Africa in the History of European Integration.” *Journal of Historical Sociology* 27 (3): 442–61. https://doi.org/10.1111/johs.12055.

Held, I. M., T. L. Delworth, J. Lu, K. L. Findell, and T. R. Knutson. 2005. “Simulation of Sahel Drought in the 20th and 21st Centuries.” *Proceedings of the National*

Academy of Sciences 102 (50): 17891–96. https://doi.org/10.1073/pnas.0509057102.

Homer-Dixon, Thomas, and Jessica Blitt. 1998. *Ecoviolence: Links Among Environment, Population, and Security*. Rowman & Littlefield Publishers.

Homer-Dixon, Thomas F. 1994. "Environmental Scarcities and Violent Conflict: Evidence from Cases." *International Security* 19 (1): 5–40. https://doi.org/10.2307/2539147.

Hopen, C. 1958. *The Pastoral Fulbe Family in Gwandu*. London.

Hsiang, S. M., M. Burke, and E. Miguel. 2013. "Quantifying the Influence of Climate on Human Conflict." *Science* 341 (6151): 1235367–1235367. https://doi.org/10.1126/science.1235367.

Huntjens, Patrick, and Katharina Nachbar. 2015. "Climate Change as a Threat Multiplier for Human Disaster and Conflict," 24.

Idowu, A A, S O Ayoola, A I Opele, and N B Ikenweiwe. 2011. "Impact of Climate Change in Nigeria," 8.

Ikenwa, Kenneth O., Abdul-Hammed A. Sulaimon, and Owolabi L. Kuye. 2017. "Transforming the Nigerian Agricultural Sector into an Agribusiness Model – the Role of Government, Business, and Society." *Acta Universitatis Sapientiae, Economics and Business* 5 (1): 71–115. https://doi.org/10.1515/auseb-2017-0005.

Institute for Economics & Peace. 2018. "Global Terrorism Index 2018: Measuring the Impact of Terrorism." Sydney.

Intergovernmental Panel on Climate Change. 2014. “Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.” Geneva, Switzerland: IPCC. https://www.ipcc.ch/report/ar5/syr/.

———. 2018. *Global Warming of 1.5°C*. http://www.ipcc.ch/report/sr15/.

Internal Displacement Monitoring Centre. 2018a. “Global Report on Internal Displacement 2018.” Switzerland.

———. 2018b. “International Displacement in 2018: Mid-Year Figures.” Switzerland.

IPCC. 2007. “AR4 WGII Chapter 18: Inter-Relationships Between Adaptation and Mitigation - 18.1.2 Differences, Similarities and Complementarities between Adaptation and Mitigation.” 2007. https://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch18s18-1-2.html.

Janicot, Serge, Sylwia Trzaska, and Isabelle Poccard. 2001. “Summer Sahel-ENSO Teleconnection and Decadal Time Scale SST Variations.” *Climate Dynamics* 18 (January): 303–20. https://doi.org/10.1007/s003820100172.

Jike, V. T. 2004. “Environmental Degradation, Social Disequilibrium, and the Dilemma of Sustainable Development in the Niger-Delta of Nigeria.” *Journal of Black Studies*, 686–701.

Keita, Kalifa. 1998. “Conflict and Conflict Resolution in the Sahel: The Tuareg Insurgency in Mali.” *Small Wars & Insurgencies* 9 (3): 102–28.

Kolstø, Pål. 2007. “The ‘Narcissism of Minor Differences’ Theory: Can It Explain Ethnic Conflict?” *Filozofija i Drustvo* 18 (2): 153–71. https://doi.org/10.2298/FID0702153K.

Kurukulasuriya, Pradeep, Robert Mendelsohn, Rashid Hassan, James Benhin, Temesgen Deressa, Mbaye Diop, Helmy Mohamed Eid, et al. 2006. “Will African Agriculture Survive Climate Change?” *The World Bank Economic Review*, no. 3: 367. https://doi.org/10.1093/wber/lhl004.

Laumann, Dennis. 2013. *Colonial Africa, 1884-1994*. African World Histories. New York: Oxford University Press. https://www.africabib.org/rec.php?RID=385942176.

LeBillon, Philippe, and Rosaleen V Duffy. 2018. “Conflict Ecologies: Connecting Political Ecology and Peace and Conflict Studies.” *Journal of Political Ecology* 25 (1): 239. https://doi.org/10.2458/v25i1.22704.

Mage, Johnson O., and Bernard T. Tyubee. 2019. “Spatial Variation and Pattern of Daily Rainfall Intensity in the Middle Belt Region of Nigeria.” *Current Journal of Applied Science and Technology*, March, 1–8. https://doi.org/10.9734/cjast/2019/v34i130114.

Majekodunmi, Ayodele O. 2018. “Social Transitions in the Savannah: The Decline and Fall of Social Risk Management amongst Fulani in the Subhumid Zone of Nigeria.” *International Journal of Social Economics* 45 (3): 535–47. https://doi.org/10.1108/IJSE-08-2016-0218.

McLeman, Robert A., and Lori M. Hunter. 2010. “Migration in the Context of Vulnerability and Adaptation to Climate Change: Insights from Analogues.” *Wiley Interdisciplinary Reviews. Climate Change* 1 (3): 450–61. https://doi.org/10.1002/wcc.51.

Moritz, Mark. 2010. “Understanding Herder-Farmer Conflicts in West Africa: Outline of a Processual Approach.” *Human Organization* 69 (2): 138–48. https://doi.org/10.17730/humo.69.2.aq85k02453w83363.

Mustapha, Abdul Raufu. 2014. *Sects & Social Disorder: Muslim Identities & Conflict in Northern Nigeria*. Boydell & Brewer Ltd.

Nicholson, Sharon. 2000. “Land Surface Processes and Sahel Climate.” *Reviews of Geophysics* 38 (1): 117–39. https://doi.org/10.1029/1999RG900014.

Nicholson, Sharon E. 2013. “The West African Sahel: A Review of Recent Studies on the Rainfall Regime and Its Interannual Variability.” *ISRN Meteorology*, January, 1–32.

Nicholson, Sharon E., Chris Funk, and Andreas H. Fink. 2018. “Rainfall over the African Continent from the 19th through the 21st Century.” *Global and Planetary Change* 165 (June): 114–27. https://doi.org/10.1016/j.gloplacha.2017.12.014.

Nwaoga, Chinyere Theresa, Anuli B. Okoli, and Favour C. Uroko. 2017. “Self-Acclaimed Religious Terrorism, Refugee Crisis, and the Plight of Internally Displaced Persons in Nigeria.” *Mediterranean Journal of Social Sciences* 8 (3): 189–95. https://doi.org/10.5901/mjss.2017.v8n3p189.

Nyamnjoh. 2013. “The Nimbleness of Being Fulani.” *Africa Today* 59 (3): 105. https://doi.org/10.2979/africatoday.59.3.105.

Nyong, A., F. Adesina, and B. Osman Elasha. 2007. “The Value of Indigenous Knowledge in Climate Change Mitigation and Adaptation Strategies in the African Sahel.” *Mitigation and Adaptation Strategies for Global Change; Dordrecht* 12 (5): 787–97. http://dx.doi.org.ezproxy.drew.edu/10.1007/s11027-007-9099-0.

Obioha, Emeka E. 2008. “Climate Change, Population Drift and Violent Conflict over Land Resources in Northeastern Nigeria.” *Journal of Human Ecology* 23 (4): 311–24. https://doi.org/10.1080/09709274.2008.11906084.

Odjugo, A. O. Peter, and A. Ikhuoria Isi. 2003. “The Impact of Climate Change and Anthropogenic Factors on Desertification in the Semi-Arid Region of Nigeria.” *Global Journal of Environmental Sciences* 2 (2): 118-127–127. https://doi.org/10.4314/gjes.v2i2.2418.

Odjugo, Peter A. O. 2010. “Regional Evidence of Climate Change in Nigeria.” *Journal of Geography and Regional Planning* 3 (6): 142–50.

Odoemene, Akachi. 2011. “Social Consequences of Environmental Change in the Niger Delta of Nigeria.” *Journal of Sustainable Development* 4 (2). https://doi.org/10.5539/jsd.v4n2p123.

Odunuga, Shakirudeen, and Gbolahan Badru. 2015. “Landcover Change, Land Surface Temperature, Surface Albedo and Topography in the Plateau Region of North-Central Nigeria.” *Land* 4 (2): 300–324. https://doi.org/10.3390/land4020300.

Ogo-Oluwa, Sylvester. 2017. “Anti-Grazing Policy and Conflict Resolution between Fulani Herdsmen and Farmers in Ekiti State.” *Asian Research Journal of Arts & Social Sciences* 4 (1): 1–13. https://doi.org/10.9734/ARJASS/2017/35979.

Ogungbenro, Stephen Bunmi, and Tobi Eniolu Morakinyo. 2014. “Rainfall Distribution and Change Detection across Climatic Zones in Nigeria.” *Weather and Climate Extremes* 5–6 (October): 1–6. https://doi.org/10.1016/j.wace.2014.10.002.

Okello, Anna L., Ayodele O. Majekodunmi, Adamu Malala, Susan C. Welburn, and James Smith. 2014. “Identifying Motivators for State-Pastoralist Dialogue: Exploring the Relationships between Livestock Services, Self-Organisation and Conflict in Nigeria’s Pastoralist Fulani.” *Pastoralism* 4 (1): 12. https://doi.org/10.1186/s13570-014-0012-7.

Okoli, Al Chukwuma, and G.A. Atelhe. 2014. “Nomads against Natives: A Political Ecology of Herder/Farmer Conflicts in Nasarawa State, Nigeria” 4 (2): 13.

Olagunju, Temidayo Ebenezer. 2015. “Drought, Desertification and the Nigerian Environment: A Review.” *Journal of Ecology and The Natural Environment* 7 (7): 196–209. https://doi.org/10.5897/JENE2015. 0523.

Olaniyan, Azeez, and Aliyu Yahaya. 2016. “Cows, Bandits, and Violent Conflicts: Understanding Cattle Rustling in Northern Nigeria.” *Africa Spectrum* 51 (3): 93-105–105.

Onwuzuruigbo, Ifeanyi. 2010. “Researching Ethnic Conflicts in Nigeria: The Missing Link.” *Ethnic and Racial Studies* 33 (10): 1797–1813. https://doi.org/10.1080/01419871003763304.

Osinubi, Tokunbo Simbowale, and Oladipupo Sunday Osinubi. 2006. “Ethnic Conflicts in Contemporary Africa: The Nigerian Experience.” *Journal of Social Sciences* 12 (2): 101–14. https://doi.org/10.1080/09718923.2006.11978376.

Peters, Pauline E. 2004. “Inequality and Social Conflict Over Land in Africa.” *Journal of Agrarian Change* 4 (3): 269–314. https://doi.org/10.1111/j.1471-0366.2004.00080.x.

Raleigh, Clionadh. 2010. “Political Marginalization, Climate Change, and Conflict in African Sahel States.” *International Studies Review* 12 (1): 69–86.

Rodríguez-Fonseca, Belen, Elsa Mohino, Carlos R. Mechoso, Cyril Caminade, Michela Biasutti, Marco Gaetani, J. Garcia-Serrano, et al. 2015. “Variability and Predictability of West African Droughts: A Review on the Role of Sea Surface Temperature Anomalies.” Review-article. Https://Doi.Org/10.1175/JCLI-D-14-00130.1. May 12, 2015. https://doi.org/10.1175/JCLI-D-14-00130.1.

Salihu, Habeeb Abdulrauf. 2018. “The Armed-Fulani-Herdsmen and Violent Attacks Against Farmers and Farming Communities in Nigeria: An Overview.” *KIU Journal of Humanities* 3 (3): 169–84.

Scheffer, Marten, Steve Carpenter, Jonathan A. Foley, Carl Folke, and Brian Walker. 2001. “Catastrophic Shifts in Ecosystems.” *Nature* 413 (6856): 591–96. https://doi.org/10.1038/35098000.

Schilling, Janpeter, Jürgen Scheffran, and Michael P Link. 2010. “Climate Change and Land Use Conflicts in Northern Africa.” *Nova Acta Leopoldina NF*, 10.

Sivakumar, M. V. K. 1989. “Agroclimatic Aspects of Rainfed Agriculture in the Sudano-Sahelian Zone.” In , 17–38. Niamey, Niger. http://oar.icrisat.org/4464/.

Solomon, Amy, Lisa Goddard, Arun Kumar, James Carton, Clara Deser, Ichiro Fukumori, Arthur M. Greene, et al. 2011. “Distinguishing the Roles of Natural and Anthropogenically Forced Decadal Climate Variability: Implications for Prediction.” *Bulletin of the American Meteorological Society* 92 (2): 141–56. https://doi.org/10.1175/2010BAMS2962.1.

Stenning, Derrick J. 1957. “Transhumance, Migratory Drift, Migration; Patterns of Pastoral Fulani Nomadism.” *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 87 (1): 57–73. https://doi.org/10.2307/2843971.

Suberu, Rotimi, and Larry Diamond. 2001. *Federalism and Ethnic Conflict in Nigeria*. First Edition edition. Washington, D.C: United States Institute of Peace.

Swift, Jeremy. 1977. “Sahelian Pastoralists: Underdevelopment, Desertification, and Famine.” *Annual Review of Anthropology* 6 (1): 457–78. https://doi.org/10.1146/annurev.an.06.100177.002325.

Tanchum, Micha’el. 2012. “Al-Qa’ida’s West African Advance: Nigeria’s Boko Haram, Mali’s Touareg, and the Spread of Salafi Jihadism.” *Israel Journal of Foreign Affairs* 6 (2): 75–90. https://doi.org/10.1080/23739770.2012.11446504.

Tenuche, Marietu S, and Olarewaju O Ifatimehin. 2009. “Resource Conflict among Farmers and Fulani Herdsmen: Implications for Resource Sustainability.” *Marietu S Tenuche (PhD)*, August.

Thelma, MOHAMMED Ngozi. 2015. “Desertification in Northern Nigeria: Causes and Implications for National Food Security.” *Peak Journal of Social Sciences and Humanities* 3 (2): 22–31.

Turner, Matthew D. 2004. “Political Ecology and the Moral Dimensions of ‘Resource Conflicts’: The Case of Farmer-Herder Conflicts in the Sahel.” *POLITICAL GEOGRAPHY* 23 (7): 863–89.

Urama, Kevin C. 2005. “Land-Use Intensification and Environmental Degradation: Empirical Evidence from Irrigated and Rain-Fed Farms in South Eastern Nigeria.” *Journal of Environmental Management* 75 (January): 199–217.

Weissleder, Wolfgang. 2011. *Nomadic Alternative : Modes and Models of Interaction in the African-Asian Deserts and Steppes.* Munchen: De Gruyter Mouton.

Wimmer, Andreas, Lars-Erik Cederman, and Brian Min. 2009. “Ethnic Politics and Armed Conflict: A Configurational Analysis of a New Global Data Set.” *American Sociological Review* 74 (2): 316–37. https://doi.org/10.1177/000312240907400208.

Wittig, Rüdiger, Konstantin König, Marco Schmidt, and Jörg Szarzynski. 2007. “A Study of Climate Change and Anthropogenic Impacts in West Africa.” *Environmental Science and Pollution Research International* 14 (3): 182–89. https://doi.org/10.1065/espr2007.02.388.

Wonah, Emmanuel Ikechi. 2018. “Sustainable Development, Generational Justice and Insecurity in Nigeria” 7 (3): 11.

World Bank Group. 2019. “Population Growth (Annual %) | Data.” 2019. https://data.worldbank.org/indicator/SP.POP.GROW?end=2017&locations=NG&start=1960.