

# Climate Change, Security and the Nexus Concept

Subjects: Others

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The nexus concept has been emerging since the Bonn 2011 Conference, “The Water Energy and Food Security Nexus—Solutions for the Green Economy”, with significant involvement from the UN and other international organisations. It has been defined as a “set of context-specific critical interlinkages between two or more natural resources used in delivery chains towards systems of provision”. From a policy perspective, it looks at delivery chains of resources, such as water and energy, in a polycentric manner, i.e., as independent providers based on ecosystem services with interlinkages across delivery stages, but without a presumed hierarchy among those dimensions. Thus, water, energy and food are seen as interrelated and of equal priority for the SDGs, considering the specific conditions of their provision and the strategic interests of relevant actors.

Keywords: climate change ; human security ; resource nexus ; Northern Nigeria ; Lake Chad

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## 1. Methods: The Nexus Concept as a Novel Approach

The nexus concept has been emerging since the Bonn 2011 Conference, “The Water Energy and Food Security Nexus—Solutions for the Green Economy”, with significant involvement from the UN and other international organisations. It has been defined as a “set of context-specific critical interlinkages between two or more natural resources used in delivery chains towards systems of provision” <sup>[1]</sup>. From a policy perspective, it looks at delivery chains of resources, such as water and energy, in a polycentric manner, i.e., as independent providers based on ecosystem services with interlinkages across delivery stages, but without a presumed hierarchy among those dimensions. Thus, water, energy and food are seen as interrelated and of equal priority for the SDGs, considering the specific conditions of their provision and the strategic interests of relevant actors.

Our paper draws on this nexus concept for the following reasons: it helps in understanding the interface between global and local drivers for environmental risks; it looks at the interface of using multiple natural resources and their delivery chains in a regional context; it contributes to a holistic understanding of the SDGs and strengthens those goals that cross-cut inclusive and sustainable growth (SDG 8), life on land (SDG15) and strong institutions (SDG 16).

While the nexus offers a promising conceptual approach, the development and use of specific rigorous methods to systematically evaluate interlinkages or support policy development has been limited. There is no specific nexus method yet, but rather a mix of different methodologies that are applied according to the scope of research, such as Input-Output Analysis based on water or other “footprints” and the use of Sankey diagrams, and a range of qualitative and semi-quantitative tools (e.g., Water Evaluation Planning, WEAP, Long-range Energy Alternatives Planning, LEAP). This paper uses the following methods in relation to the nexus approach: (i) a case study approach based on a scoped literature survey and interdisciplinary insights transcending environmental research and policy analysis, (ii) a cautiously crafted comparative approach with a paper analysing our scope for Kenya <sup>[2]</sup>, where we seek to counter risks of oversimplification across both cases by key references underlining specific circumstances and (iii) a scenario approach addressing gaps in the literature as stated above that follows selected nexus papers on this topic and recent foresight literature <sup>[2][3]</sup>. While being a research-based concept, it is important to underline that the nexus does inform implementation strategies, for instance via a Water-Energy-Food Knowledge-Action Network hosted by Future Earth and the WEF security resource platform. As a bottom line, it is thought that the nexus concept helps to overcome a silo mentality leading to the SDGs being pursued in isolation, where interlinkages are potentially underassessed or even overlooked.

## 2. The Case of Northern Nigeria

Nigeria, with a population of about two hundred million people and thirteen million cattle, is faced with the impacts of both climate change and unsustainable population growth, as this population is expected to double by 2050. Nigeria has a land mass of about 923,800 km<sup>2</sup> and a total surface area of about 91 million hectares <sup>[4]</sup>. However, Nigeria’s large and rapidly

growing population is putting dire pressure on the environment and its limited resources, which are also threatened by climate change.

Writers like Okoli et al. <sup>[5]</sup> argue that desert encroachment triggered the disappearance of grazing and fertile lands, thus indicating a causation between climate change and rising human insecurity in Nigeria. But Benjaminsen et al. <sup>[6]</sup> opine that political failures such as allowing for ungoverned spaces, rent seeking and intrusion are the main factors underlining a lack of authority and legitimacy as drivers for conflicts and weakening security. Ironically, the latter did not consider the role of climate change as a possible reason for scarcity of resources and the incursion on farmlands by migrating herdsman. We propose that resource scarcity, worsened by climate change and institutionally determined access to resources, have aggravated conflicts and insecurity in Northern Nigeria.

To illustrate this perspective, we briefly look back on the last twenty years. As the twentieth century came to an end, while some urban areas in Nigeria faced rising crime and social insecurity due to rapid unplanned urbanization <sup>[7]</sup>, rural areas were generally safer in terms of social and physical security, with most of the dwellers earning their living from subsistence agriculture. There was generally a low level of crime, conflicts and physical insecurity among the rural dwellers. For quite a long time, the northern part of the country featured the Sahel savanna for farming and pastoralism. The central part, with its lowland rain forest and savanna, served as the food basket of the country, attracting nomadic herdsman who moved southwards during dry seasons in search of pasture and water, and then northwards during the wet season. The southern part, with its heavy rain and mangrove forests, had plantation farmers, fishermen and some Fulani pastoralists (also called herdsman); the latter have been moving across the northern and southern parts of the country between seasons. During those previous years, security was not beyond government control, while the citizens could engage in their socio-economic activities freely.

However, the changing climate now makes shifting weather patterns and water insecurity more unpredictable, extreme and stressful; those factors started to exceed the intimate understanding of natural rhythms associated with climate and weather across different temporal scales within the different groups competing for access to land. Rising competition by Fulani nomads for a depleting grazing land caused by climate change and overgrazing pitched the migrating herdsman against indigenous farming communities <sup>[8]</sup>. According to Amobi and Onyishi <sup>[9]</sup>, Nigeria, with its location and unique ecology, is now highly susceptible to the fluctuating effects of climate change, which further extends the insecurity as nomadic herdsman from the north move downwards towards the central and southern states in search of grazing land for their cattle.

In terms of community cohesion and livelihood sustainability, communities have become increasingly insecure in a tightening competition over scarce resources, as the Sudan savanna of the northern and middle parts of the country transits to pure Sahel, and the influence of the Sahara increases southwards. As the ecology of the Guinea savanna gives way to Sudan savanna grassland, the nomadic herdsman of the lower Sahel and Sudan savanna ecosystems migrate to the Guinea savanna and forest belt of the South <sup>[10]</sup>. This can be seen as a regime shift in the regional vegetation and land use cover, and part of a larger transition, or potentially an escalation, towards insecurity and conflicts.

Following Slettebak <sup>[11]</sup>, our identification of a regime shift in land use in northern Nigeria is at a risky intersection between human security and conflicts. The migrating herders sometimes displace communities and farmers in search of perpetual grazing lands while their livestock ravage crops and farmlands, resulting in conflicts or rising insecurity. This is a departure from the past, when the herders stayed intermittently and both parties coexisted peacefully, without any threat of existentialism. Lacking enough grazing land to return northwards to during the wet season, the herders' sojourn southward is no longer temporary. States with more green vegetation such as Plateau, Benue, Taraba, Adamawa and Kaduna have seen various forms of confrontations and violent conflicts between migrating herders and communities over access to scarce resource of land and water exacerbated by climate change.

While Sayne <sup>[12]</sup> believes that no one knows the full security implications of climate change, it seems also fair to say that the government and people hitherto did not consider the full implication of climate change on security in Nigeria. A relevant observation in our case is the increasing ruthlessness of some attacks. Amidst different attacks on farming communities, an estimated 500 villagers were reportedly killed by suspected armed herdsman in the farming community of Dogo Nahawa in 2010, and about 100 people were also killed in Barkin Ladi in June 2018, again by suspected armed herdsman, all in Plateau State <sup>[13][14]</sup>. There have also been incidences of cattle rustling and killings of herdsman in farming communities, thereby perpetuating the security breach.

We agree with Conroy <sup>[15]</sup> and Sayne <sup>[12]</sup> that climate change patterns leading to low rainfalls and approaching deserts, particularly in the last three decades, are responsible for the upsurge in the southward migration of the nomads searching for pasture and water. However, "owing largely to its plurality and ethnic divide, environment-induced migration creates volatile contact and competition between groups of highly conflicting natural resource-dependent livelihood systems" <sup>[16]</sup>.

Because the herdsmen are mainly Fulani and predominantly Muslim, while several farming communities in the central part are largely Christian, the conflicts sometimes assume a religious dimension <sup>[16]</sup>; this seems in line with De Juan and Heinze <sup>[17]</sup>, who conclude on ethnic polarisation being relevant, but not a primary driver for conflicts. Ultimately, climate-induced and resource-driven migration substantially endangers security and creates socio-economic disorders. In our case, there is evidence of such movements escalating fierce competitions and skirmishes over access to natural resources between farming communities and the migrating herdsmen. We wouldn't deny that climate migration also leads to beneficial adaptive outcomes through, for example, allowing people to enter seasonally into the cash economy and send back remittances to their rural homesteads, which promotes development. Our case study, however, reveals little evidence for such benefits of migration, but instead points towards a different direction of increasing conflicts. The next section looks at underlying land use policy patterns that could potentially either drive conflicts or facilitate risk mitigation.

## **2.1. Land Use Policy Matters: An Appraisal of Grazing Policies in Nigeria**

Land and water are key natural resources worldwide which are also used for the cultivation of crops and grazing of livestock. It is evident that the wide range of lands which preserve the earth's biodiversity also offer a means for sustenance all around the world. Though both resources and their usage are essential to human existence and ought to be utilized sustainably, human activities such as climate change contribute significantly to the availability or scarcity of land and water. Taiye <sup>[18]</sup> documents that there are in Nigeria, "about 210 persons and 180 grazing animals per kilometre square of land and 15,000 persons and 12,500 grazing animals per kilometre square of water, leading to high demand for food, water and fodder and stress on the environment". These statistics give a visual interpretation of how transhumance grazing, deforestation and irrigation reinforced by climate change are damaging the environment and biodiversity in Nigeria.

Climate change and other environmental factors also threaten the sustainability of land and water in Nigeria, as elsewhere, with serious implications for food, livelihoods, security, peace and sustainable development. This paper aligns with Okoli and Atelhem <sup>[5]</sup> on the eco-violence theory, whose key assumption is that insecurity and conflicts are being induced by competition over scarce natural resources. Climate variability is also rapidly worsening resource scarcity, hence creating a conflict pathway driven by scarcity, agricultural practices and migration. Next, we will analyse migration in the context of grazing policies in Nigeria.

## **2.2. Previous Grazing Policies**

The southward migration of Fulani herdsmen and their encroachment on farmlands in search of freshwater and grassland for cattle, and the depletion of grazing areas because of unsustainable population growth, have exacerbated the conflicts between the herdsmen and farmers in Northern Nigeria. To address the violence over resources, the Nigerian government initiated or conceptualized different grazing policies: the grazing reserve, grazing route, anti-open grazing reserve, rural grazing area (RUGA) and the National Livestock transformation plan policies.

- Grazing Reserves and Routes Policy:

In 1964, Nigeria's first law on Grazing Reserve was introduced to settle the Fulani nomads on lands with pastures for their livestock, but the policy was poorly implemented. Envisaging the impending resource crisis and a low productivity, the then military government in 1988 decreed the National Agricultural Policy of 1988. At least 10% of the republic's approximately 10 million acres was to be reserved for grazing. A policy failure led to the acquisition of a dismal 3% of the proposed areas <sup>[19]</sup>. Again in recent years, there was an effort to create grazing routes and reserves in some selected states of the federation through the National Grazing Route and Reserve Commission Bill of 2011 <sup>[4]</sup>. It was rejected by the federal legislators who argued that it was unconstitutional for the federal government to set up grazing routes and reserves across states in a federal system <sup>[19]</sup>. This policy was also opposed in the central and southern states of Nigeria.

- RUGA Policy:

The Rural Grazing Area (RUGA) policy was designed to organize and settle pastoralists on lands providing basic amenities, infrastructure and markets. It is a prototype of 40 units of huts for 10 farmsteads on at least 20 hectares of land, mostly in the central and southern states <sup>[20]</sup>. However, fears from the people of these states led to uproars and fierce resistance. In questioning the policy and calling for its better handling, Nigeria's only Nobel laureate Wole Soyinka added his voice to the unpopularity of the policy <sup>[21]</sup>. Amid the uproar from some quarters, the government announced the suspension of the RUGA policy, claiming inconsistency with the approved national livestock transformation plan <sup>[22]</sup>.

- National Livestock Transformation Plan (NLTP):

Consistent with the nation's public announcement trends, Nigeria's Vice President announced that the NLTP would modernise livestock production using a mix of nomadic breeding and ranching that would serve a modernised dairy and meat processing industry. Unfortunately, controversy still trailed the NLTP due to its similarity with the unpopular RUGA policy, because many people believed that the NLTP was an alternate method of implementing the RUGA policy.

- Anti-Open Grazing Policy:

Ekiti and Benue states were the first states to introduce the anti-open grazing law to tackle the menace of open grazing and the accompanying conflicts. Against the odds, the 2016 Ekiti state anti-grazing policy barred the grazing of cattle and other animals on any land in the state which has not been authorized for ranching by the governor <sup>[23]</sup>. The Benue state government, effective November 2017, also banned open grazing and requested the setting up of ranches <sup>[16]</sup>. While states with high casualty like Plateau and Adamawa do not have an anti-grazing law, Miyetti Allah Cattle Breeders Association of Nigeria (MACBAN), an ethno-cultural umbrella body of the Fulani herdsman, decried the law as contravening the nation's constitution on freedom of movement and the right to settle anywhere in Nigeria <sup>[24]</sup>.

We conclude here on the long-standing experience with migration and grazing policy in Nigeria; what has changed is the more permanent migration induced by resource scarcity over land and water, as well as the increasing violence and security ramifications. The recent anti-open grazing policies in some states may postpone conflicts there, if implemented properly; however, they are likely to lead to a regional shift with increased conflicts in other states, and will need proper enforcement. The next section, therefore, looks at a case with similar environmental challenges in a comparable geographical setting but slightly different institutional mechanisms and development challenges.

### 2.3. A Brief Comparative Analysis of Nigeria and Kenya

Following a similar nexus approach, Daher et al. <sup>[2]</sup> assess the climate-security-resource nexus in line with other work on the nexus interlinkages and ramifications across utilization of resources <sup>[1]</sup>. Northwestern Kenya comprises seven counties and is considered arid and semi-arid land, where the predominant livelihood is pastoralism. This same region in Kenya is affected by climate change and, consequently, a rising level of climate induced insecurity <sup>[2]</sup>. Much like in Nigeria, climate change is manifested in the semi-arid northwestern and northeastern states, but the security implications linked to it due to desertification and low rain falls extend mostly to the north central states of Benue, Plateau, Nasarawa, parts of Kaduna and some northeastern states like Adamawa and Taraba. The first quarter of 2018 witnessed attacks in Benue and Plateau states by alleged armed herdsman as they sought to expand downwards in search of land and water for grazing <sup>[25]</sup>. We do not claim to search for specific reasons but observe that, unlike in Kenya's case, the climate security nexus in Nigeria is transported beyond the original location where the climate impact occurs. Just to note, one could argue that in northwestern Kenya, climate impacts are also quite pronounced in different regions from where the impacts are directly seen; for example, around Lake Turkana where 300,000 people live on the border of the Omo valley in Ethiopia, Uganda and South Sudan and have had food, water and energy security impacted by climate change as it becomes more difficult to access grazing land and water. If <sup>[26]</sup> was right, that nearly 64% of the Nigerian landmass is threatened by desertification which is likely to affect almost 65 million people directly or indirectly, we can then postulate that this figure considered the people both in the climate endangered zone and those in other climate-induced insecurity zones.

Although Nigeria operates a Land Use Act promulgated in 1978 which vested power of lands on the subnational governments <sup>[19]</sup>, most lands in the communities are either privately owned or ancestrally inherited. Most rural lands are not communally owned in Nigeria, unlike the lands in northwestern Kenya, which are jointly owned by the community under group ranches <sup>[27]</sup>. So far, there are fewer negative reactions to the privatization of lands in Nigeria than in Kenya, based on the article by <sup>[2]</sup>. However, there are also various tenure regimes in northwestern Kenya with varying degrees of tenure security. This is particularly the case with increasing privatization around Lake Turkana, where there is the largest investment in windfarms in Africa. The same is true in other areas in the north, where since the 1930s there has been a lot of land acquisition by British settlers. The problem in Nigeria, however, is the displacement of farmers or communities from their ancestral lands and villages by armed herdsman, who sometimes invade the communities or encroach on farmlands to graze their cattle. In reaction to the Federal Government's attempt to create grazing reserves around the country <sup>[28]</sup>, there were calls for the private acquisition of land for ranching by interested herders.

There is an increasing community-based conservation in Kenya's northwestern region <sup>[2]</sup>, which in our opinion has dual implications. As the region battles with climate change, conservation appears to become an appropriate response—although it may limit land available for grazing in the short run. This puts land use under additional stress. There is quite extensive degradation and deforestation in northwest Kenya—leading to soil nutrient mining, soil erosion, the loss of livestock weight and thus the quality and quantity of meat and milk, as well as loss of biodiversity <sup>[29][30]</sup>. Comparing this deterioration with Nigeria, the migrating herders and the farmers are both deforesting the region, which has dual

implications with potentially severe impacts over the next years <sup>[31]</sup>. The accompanying loss of ecosystem services exposes the region to the approaching desertification and intensifies the conflict, as both farmers and pastoralists compete for waning land and water resources. The long run implication is worsening human and environmental security as land and water become scarcer.

While the region in Kenya is undergoing massive development leading to transformation <sup>[2]</sup>, the same cannot be said of the region in Nigeria. Plummeting crude oil revenue, affecting government expenditure and wider insecurity, have led to a lull in development activities in these areas with consequences for livelihoods, further undermining security as manifested in the sharp rise in kidnappings for ransom. Nigeria faces a more perilous security situation than Kenya, as **Table 1** shows. Nigeria is currently the third most terrorized country in the world and the first in Sub-Saharan Africa, while Kenya holds the 23rd position globally and the 10th in Sub-Saharan Africa. Terrorism is defined in the Global Terrorism Index (GTI), published by the US Institute for Economics and Peace (IEP), 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” <sup>[32]</sup>.

**Table 1.** Comparison of Nigeria and Kenya on SSA Global Terrorism Index (GTI) 2002–2019 (GTI 2020 (p. 50), US IEP).

No.	Country	Overall Rank	Regional Rank	Change 2002–2019	Change 2018–2019	Overall Score
1	Nigeria	3	1	4.805	−0.286	8.314
2	Kenya	23	10	1.011	−0.100	5.644

According to the Global Terrorism Index, Nigeria had the worst terrorist attacks in Africa, with deaths from the alleged armed herdsmen accounting for 26% of terror-related deaths in 2019 <sup>[32]</sup>, an indication of increasing insecurity and resource conflicts between the herdsmen and farming communities. We refer to <sup>[33]</sup> for a statement on climate change and terrorism reinforcing each other through a response loop; however, we also point to the need for more in-depth research on causal loops to also address religious and political issues in a conflict pathway analysis. We conclude that the resource nexus security analytical framework used by <sup>[2]</sup> in Kenya is useful to apply to our case study of Nigeria to assess impacts of climate change and challenges for governance arising through changing patterns of land use and migration; however, we note that the scope and context differ, and both the violence and the vulnerability seem larger in northern Nigeria due to those specific conditions.

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