

A photograph of a large herd of cows in a lush green field. The cows are of various colors, including brown, white, and brown-and-white. In the background, there are rolling green hills and some trees under a clear sky. In the top right corner, there is a white circular logo containing the text 'Grassland Real Estate Enterprise Networks (GREEN)'.

Grassland Real
Estate Enterprise
Networks
(GREEN)

TAMING THE COWS WITH THE INVISIBLE HAND

*A Journey Down the Rabbit Hole of
Nigeria's Farmer-Herder Crisis*

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...Cows go where the grass is. Locate luscious green grass in guaranteed safe spaces, far away from arable farms and forest reserves, and the force of the invisible hand will herd the cattle in that direction...

...A stockholding option that will see GREEN ranches buying up cattle from average or smallholder herders and paying such herders in the form of stocks. In other words, current cattle owners will have the option of buying stocks in GREEN ranches using their current cattle herds...

SYNOPSIS

Nigeria's farmer-herder crisis has claimed thousands of lives and displaced hundreds of thousands more. Although the crisis is mostly viewed through the lenses of conflict and crime, the farmer-herder crisis is a complex problem with ten dimensions. However, the ten expressions of the crisis are also solution channels laden with opportunities. Inspired by personal experience and guided by evidential deductions, *Taming the Cows with the Invisible Hand* takes the reader on a "rabbit hole" journey into Nigeria's farmer-herder crisis. In the quest for solutions, the Grassland Real Estate Enterprise Networks (GREEN) offers social investors, venture capitalists, the billionaire changemaker and Nigerian conglomerates a model for solving profitably what is essentially a business problem with a momentous socio-political dimension that has defied existing intervention efforts. Despite deploying research tools where necessary, *Taming the Cows with the Invisible Hand* is not an academic research paper. It is a social investment proposition aimed at solving a wicked problem systematically and sustainably.

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PROLOGUE

Raped and Murdered

All she did was go to the farm, her farm, to look for daily bread. And I'm told that right there, she was brutally raped and murdered by Fulani herdsmen. When she did not return home, the family went out looking for her and her corpse was found in the farm, assaulted, almost naked.

I recall with pain these words of mine to my mentor on May 23, 2017. I had just wept profusely upon receiving the heart-breaking news of the gruesome assault and murder of my aunt (uncle's wife) the previous day. The deceased (name withheld) had played a nurturing role in the first six years of my life while I lived with my uncle, the bereaved husband, in Uzoghlo Village, Ewu, Edo State, in the South of Nigeria. Now, decades later, here I was reading of her unfortunate demise on the internet.

While I struggled to comport myself, I was informed that the young men of the village had taken to

retaliatory violence, ransacking the tents of the herdsmen and slaughtering cows. The herdsmen had apparently fled, abandoning their cows, having sensed danger. The aggrieved youths then turned against everyone of Hausa/Fulani descent that they could lay their hands on.

The situation was further aggravated by the alleged bias of the army who had reportedly been called upon by the herdsmen to intervene. Most likely fed with misleading information, and not informed of the trigger for the reprisals, the army turned on the protesting youths and shot one of them in the foot. Fortunately, however, the head of the local police unit intervened by leading the army commander to the corpses of the two women who had been assaulted and murdered on the same day by the criminal herdsmen. This ensured that there was no further loss of lives either in the retaliatory protest or in the repression by the army.

In despair, I reached out to a member of the Edo State House of Assembly, a former Speaker of the House, regarding the incident. My mentor also forwarded my message of grief to a friend of his, a Fulani, who is a Governor in one of the states in northern Nigeria. News

of the crisis would eventually bring the Governor of Edo State to my uncle's house in Uzoghlo Village as part of efforts to heal wounds and restore tranquillity to the village. I choose not to disclose specific names as I would like to keep this discourse as apolitical as possible and to keep the focus on business-oriented and social investment solutions rather than on politics. Nevertheless, the political dimension of the problem is not left out in this systematic analysis of a complex problem but is dealt with in the 8th chapter.

After that incident, I went through the gamut of emotions, from shock to grief to anger, and then, to contemplation. I recalled my first encounter with herders of Fulani extraction as a secondary school student in Ekpoma, Edo State. In those days in the early to mid '90s, we would walk along the bush paths to and from the old site of University Secondary School (now Ambrose Ali University Secondary School, Ekpoma). Before sighting the slender and agile Fulani herdsman gracefully chaperoning his cows as they roamed the bushes and fed on grass, we would first encounter cow dung on grasslands and pathways and would occasionally step foot on same. The green mounds of cow droppings and the characteristic smell were the

signs the herdsmen would leave behind to indicate that “we have been here”. I wondered why, over the years, the green mound had been replaced by trails of blood and tears.

In any case, I refused to allow my grief degenerate into the primordial inclination to tribalize a multifaceted problem. I had grown up highly detribalized. I have blood relatives from the northern part of Nigeria. I was particularly moved by the reaction of my uncle whose wife had been murdered. I was told that when the young people took to violent retaliation, one of the Hausas in the village sought refuge in his house. At the risk of incurring the wrath of the aggrieved youths, my bereaved uncle protected the Hausa man from the rampaging youths. However, feeling endangered, my uncle temporarily fled the village and relocated to Benin City until tensions were eased. He passed on three years later.

I had my youth service in Jigawa State and rendered voluntary services beyond my primary assignment. During my service year, I only travelled back to Lagos for the post-orientation break. Thereafter, throughout the rest of the service year, I remained in Jigawa,

engrossed in service to the Kafin Hausa and Hadejia communities until the end of the service year. Moved by the suboptimal conditions of the area in comparison with the enormous potential I could see all around me, I consulted on public policy for a political leader, a would-be member of the National Assembly representing the Kirikasamma/Birniwa/Guri Federal Constituency. Furthermore, in addition to moderating “Corpers’ Forum”, a radio show on Radio Hadejia, I created a community health radio programme - *Community Health Update*, initiated an anti-HIV campaign and developed close ties with the students of Science Secondary School, Kafin Hausa where I taught Biology. In those days, I would stand at the “Corpers’ Lodge” of the school and dream of the possibilities of Sahelian agriculture as I viewed with awe the vast expanse of land before me. I am Nigerian and, as such, I had no need to “ethnicise” the issues I was confronted with twelve years after my service year.

The Rabbit Hunt

Following my aunt's brutal demise, my contemplations took me to my childhood experiences under her care. I recalled how, as a child, four to five years of age, I would accompany the adults to the farm. I recalled how we hunted the African giant rat, *Cricetomys*, colloquially referred to as "rabbit". The rabbits were often found in underground burrows with several chambers or cavities. Our hunting tools were closed cans of burning smoking charcoal with perforations to allow for the escape of smoke.

On sighting a rabbit hole, we would first scout the surroundings for the various outlets of the rabbit hole. We would then insert a smoking can in the main hole while blocking the other cavities as well. Meanwhile, we would have kept guard at each of the outlets expecting that the rabbit could attempt an escape through any of them. We would then dig into the main hole after administering the choking smoke. While ruminating on these personal historical experiences, I began to pay closer attention to Nigeria's farmer-herder crisis, a problem whose complexity and multifaceted nature reminded me of the rabbit hole.

This piece is a guided “rabbit chase” towards solving the farmer-herder crisis. In hunting down this “rabbit”, I have located a network of ten cavities, namely:

1. Career
2. Culture
3. Civilization
4. Climate
5. Conflict
6. Crime
7. Conspiracy
8. Campaign
9. Competition
10. Capital

Like a rabbit hole which commences with a visible and accessible entrance and progresses into overlapping layers of depth, we will commence with a simple relatable dimension of the problem. We will then go down the rabbit hole into depths of complexities and finally retrace an upward exit through the central theme of this ideation paper – market driven solutions. The uniqueness of this rabbit chase is in the fact that it deemphasis government action and places emphasis on private sector-led solutions.

CHAPTER 1: THE CAREER CAVITY

We begin this rabbit chase in the Career Cavity. In its simplest form, the farmer-herder question is, first of all, a career question. By career analysis, the Fulani herdsman is a nomadic pastoralist while the arable farmer is a crop grower. The word “career” may sound bogus in relation to the herdsman and farmer, but the fact is, if these activities are engaged in for a lifetime as a major vocation by which a living is earned, then they are career paths. Therefore, the farmer-herder crisis is, on the surface, a **clash of careers** in which the output (plants) of one career group (farmers) could be the input (feed) of the other (herders), just as the output (drugs) of the pharmacist is the input (prescription) of the doctor. Merely observing the situation from this angle preliminarily points to an opportunity, not a problem, if we could only manage the other factors.

Furthermore, approaching the issues with a little dose of creativity, in principle, the pattern of transition of a nomadic herdsman is reminiscent of the stock-in-trade of a career nomad. A career nomad moves from job to job in search of greener pastures – figuratively - while a nomadic herdsman moves from place to place in

search of greener pastures - literally. Therefore, it would be instructive to examine the movement of the herdsman in the figurative light of a “career move”.

At the end of every career move is some form of beckoning opportunity. Such opportunities could signal better remuneration, greater exposures, favourable working hours, reduced risks, an attractive organisational culture, perks such as travel, and so on. Every career move is propelled by that human instinct to reach for something better. Primitive though the nomadic herdsman may come across, in moving from place to place, he is driven by the same motivations that propel the frequent change of jobs of a junior, or even senior, executive, in response to industry opportunities.

Not only is the nomadic herdsman driven by similar basic motivations as the career nomad, he is also affected by similar consequences. For example, career nomads may not grow as they should because they never settle on the job to build capacity. Likewise, nomadic cattle do not grow optimally because they lack the needed rest to build tissue mass. On a lighter but equally serious note, the migratory lifestyle of the

nomadic Fulani herdsman may well be responsible for his slender build.

Furthermore, career nomads are increasingly distrusted by the corporate community. Likewise, nomadic cattle herders have become increasingly distrusted by host communities. Career nomads have no attachment to the jobs they accept and are attracted only to the terms of those jobs, moving on when they find greener pastures. Similarly, herders have no attachment to their workspace, that is, the forage area consumed by their cattle but could be deeply and emotionally attached to their cattle; they move on to greener pastures when an area has been sufficiently grazed and even overgrazed by the cattle. Employers may seek to reduce high employee turnover by offering competitive terms but, in many cases, a career nomad is merely an entrepreneur or self-employed go-getter bidding his or her time. This entrepreneurial inclination of a career nomad could shed light on possibilities for the Fulani herdsman.

The arable farmer, in contrast, has a lower workspace transition rate, cultivating own or leased farmland, at least for the entire farming season. While the nomadic

herder is accustomed to a migratory path, the arable farmer is more inclined to a tenured path, nurturing an entity (the crops) to maturity in one workspace. Moreover, because the arable farming career path keeps the farmer within one geographical space for a considerable period, he builds a sense of community with neighbouring farmers and is, more often than not, a member of the host community. Consequently, unlike the nomadic herder, the arable farmer has greater attachment to the workspace - the arable land upon which he cultivates his crops.

These different farmer-herder inclinations reflect distinctive behavioural competences that could be harnessed, not only in solving the problem at hand, but in creating value. This piece touches on models of value creation in subsequent parts but, for now, it suffices to make an audacious proposition: The cultivator dispositions of the local farmer are highly desirable competences in business management while the spatial restlessness of the herdsman, manifest as a nomadic or itinerant lifestyle, is a pointer to adventurous competences that are useful for the start-up enterprise pathway. At this juncture, our rabbit chase takes us to the Culture Cavity.

CHAPTER 2: THE CULTURE CAVITY

We have dug down the Career Cavity and shown the differences in behavioural competences between the nomadic herder and the arable farmer. In the Career Cavity, we examined the aptitudinal and vocational differences between the herdsman and the farmer, void of any ethnic context.

However, digging further down the rabbit hole, we will now take a bend into the cultural uniqueness of the Fulani herdsman. We will focus on the Fulani herdsman because, in the Nigerian context, his is the cultural constant in this interface while the farmer, with whom he interfaces, manifests diverse cultural identities depending on the geographical location. In Nigeria's North-Central region, the farmer could be a Birom in Plateau State or an Idoma in Benue State. In the South-West, the farmer is most likely a Yoruba while, in the South-East, he or she is most likely Igbo. My farmer aunt who was murdered in her farm in Edo State in Nigeria's South-South region was Esan (Ishan).

Our first objective in the Culture Cavity is to buttress the assertion that the nomadic Fulani possesses latent entrepreneurial skills by pointing out some similarities

between him and the ubiquitous Igbo. The average Igbo is not accustomed to confinement in a regional space. Instead, he or she has a high migratory tendency. This is why the Igbos are a very widely dispersed ethnic group found almost everywhere in the world just as the Fulanis are dispersed across West Africa without regard to national borders. It is no coincidence that the high rate of migration among the Igbos comes with a highly enterprising spirit that sets him or her apart everywhere he or she goes. There is something about that beyond-frontier spirit - that tendency to go beyond borders - that speaks of daring enterprise. I posit that the Fulani herdsman possesses this enterprise instinct even if in a latent, untapped form.

The cultural identity of the Fulani is captured in the Fulani code known as *Pulaaku*. Encyclopedia.com has this to say about the Fulani code:

Pulaaku prescribes semteende (modesty and reserve), together with munyal (patience) and hakkiilo (common sense, care)... It portrays the ideal Fulani as one who has stoic

sobriety, reserve, and strong emotional ties to cattle. At the same time, the model Fulani is gentle in demeanor. His carriage conveys a proud reserve, almost a disdain toward non-Fulani.¹

Despite the similarity in migratory ubiquity, the Fulani differs from the Igbo in the former's reserved disposition in contrast to the boisterousness of the later.

It is said that no one knows what a Fulani is thinking. The true Fulani is physically as well as psychologically distant from other people, especially non-Fulani. Moreover, he is enjoined from displays of strong emotions. His demeanor is taciturn, loathing the boisterousness of others. Wealth is not to be vulgarly displayed but carefully and quietly tended.²

¹ Encyclopedia of World Cultures. . Encyclopedia.com. 15 Apr. 2021 ."
Encyclopedia.com. Accessed May 01, 2021.
<https://www.encyclopedia.com/social-sciences-and-law/anthropology-and-archaeology/people/fulani>.

² Ibid.

These attributes have come handy for the pastoral Fulani in maintaining economic independence. Thus, the Fulani code also reminds one of the puritan code of the early European settlers of the American colonies whose republican entrepreneurial grit founded America over a century before America's independence. The puritan code emphasized "devotion to self-discipline, hard work, duty, responsibility and thrift"³. Two centuries after the early settlers, the frontier tendencies of the puritans would evolve into the iconic symbol of the "Wild West"⁴, the adventurous American cowboy. Like the Fulani herdsman, the American cowboy, in the course of his business, often got into conflict with farmers. The era of the cowboy lasted only about 30 years⁵, yet the venturesomeness of the hat-wearing, horse-riding, gun-wielding cowboy inspired such heroic legends only matched by folklore.

³ "What Are Puritan Ethics?" Reference. Accessed May 01, 2021.

<https://www.reference.com/world-view/puritan-ethics-710b45a84d1fdfab>.

⁴ "American Frontier." Wikipedia. April 17, 2021. Accessed May 01, 2021.

https://en.wikipedia.org/wiki/American_frontier.

⁵ Hamilton, E.L. "The Wild West Era, a Period of Myth-making Cowboys, Gunslingers, and Saloon Madames, Actually Lasted Only 30 Years." The Vintage News. January 25, 2018. Accessed May 01, 2021.

<https://www.thevintagenews.com/2017/12/31/wild-west-era-2/>.

Nevertheless, the legend of the cowboy is more branding and storytelling than history.⁶

In summary, the following attributes of the Fulani are worth taking note of:⁷

- strong affinity to ethnic identity as well as a sense of cultural superiority;
- supportive networks between the town Fulani and the nomadic Fulani - the town Fulani cattle owner may hire a nomadic Fulani herdsman;
- respect for hierarchy and a tendency to draw inspiration from accomplished Fulanis;
- inclination to folklore eulogizing Fulani heroism.

These cultural attributes could provide insights for business models as well as brand communication strategies as part of interventions in the farmer-herder crisis in Nigeria and the broader West Africa.

⁶ Williams, Leah. "How Hollywood Whitewashed the Old West." *The Atlantic*. October 05, 2016. Accessed May 01, 2021. <https://www.theatlantic.com/entertainment/archive/2016/10/how-the-west-was-lost/502850/>.

⁷ Encyclopedia of World Cultures. . Encyclopedia.com. 15 Apr. 2021 ."
Encyclopedia.com. Accessed May 01, 2021.
<https://www.encyclopedia.com/social-sciences-and-law/anthropology-and-archaeology/people/fulani>.

CHAPTER 3: THE CIVILIZATION CAVITY

The Farmer-herder crisis is, at some point and, in some way, a “clash of civilizations”. Although Samuel Huntington’s *The Clash of Civilizations and the Remaking of World Order*⁸ deemphasizes economic and political factors in its forecast of world conflicts and, although the book attributes volatilities to conflicting cultural interactions and seems to equate cultures with civilizations, Samuel Huntington’s title is apt for an understanding of the farmer-herder crisis. Nevertheless, culture is different from civilization.

Civilization is the outward manifestation of culture. Culture refers to a society’s paradigms or patterns of thought, behaviour and action while civilization refers to the society’s scientific, technological, artistic, organizational, political and other forms of advancement. Further down the rabbit hole, into the Civilization Cavity, we find that the problem at hand is sustained by primitive and subsistent approaches to pastoral farming. In other words, the resilience of nomadic cattle herding in the 21st century is

⁸ Huntington, Samuel P. *The Clash of Civilizations and the Remaking of World Order*. New York: Simon & Schuster, 1996.

tantamount to a drive against the traffic of civilization. The following are some of the characteristics of civilization currently being resisted by nomadic cattle herding practices:

1. Telecommuting versus Nomadism

Aided by technology, civilization is driving in the direction of sedentarism in most fields of endeavour. Even before the coronavirus pandemic made working from home the new normal⁹, the trend towards telecommuting already indicated a workplace civilizational shift as more and more companies were already planning to introduce telecommuting or work-from-home policies. In five years, between 2005 and 2010, the number of people working from home had increased by 140%.¹⁰ Bringing this civilizational shift to cattle herding would amount to making a case for sedentary herding practices such as homestead cattle farms and ranches. Sedentary herding creates a

⁹ "Fulani | Encyclopedia.com." Accessed May 01, 2021.

<https://www.encyclopedia.com/social-sciences-and-law/anthropology-and-archaeology/people/fulani>.

¹⁰ Baine, Evelyn, and Sam Wu. "The Ultimate List Of Remote Work Statistics - 2021 Edition." SmallBizGenius. January 06, 2021. Accessed May 01, 2021.

<https://www.smallbizgenius.net/by-the-numbers/remote-work-statistics/#gref>.

contrasting workspace culture to the nomadic lifestyle of the Fulani herdsman.

2. Remote versus Proximal Impact Control

Civilization is trending towards remote access, management and control of activities and results in different fields. The TV remote control is a simple but classic symbol of this trend in civilization. Since the invention of the TV remote control in 1955, the technique has been proliferated in usage, from consumer electronics to industrial machinery and from military activities to space exploration. Drone technology is a significant advancement in this regard. A 2021 report by Business Insider captures this development.

From quick deliveries at rush hour to scanning an unreachable military base, drone features are proving to be extremely beneficial in places where man cannot reach or is unable to

perform in a timely and efficient manner.¹¹

Folio3, an animal care software solutions provider reports that drone technology is proving useful in diverse operations, from herding to monitoring to security.

One of the interesting use cases of drones for cattle farming is that farmers can remotely check water sources and know where the cattle are in some of the remote canyons.¹²

Drone technology is especially useful in systematic monitoring of cattle movement on rangeland ranches which cover extensive areas of land with a wide range of vegetation.

Another benefit of drones for cattle ranching is the ability to spot heavily

¹¹ Intelligence, Insider. "Drone Technology Uses and Applications for Commercial, Industrial and Military Drones in 2021 and the Future." Business Insider. January 12, 2021. Accessed May 01, 2021. <https://www.businessinsider.com/drone-technology-uses-applications?IR=T>.

¹² Folio3. "Drones for Livestock Management." Folio3 Animal Care Practice. February 10, 2020. Accessed May 01, 2021.

grazed areas and thickets of thistles and cedar trees without having to drive the entire pasture. The images taken by drones can be used to decide where to build fences and where to move cattle.¹³

Furthermore, e-shepherding¹⁴ or virtual fencing¹⁵ and remote sensing¹⁶ technologies have proved to be more efficient than the proximal impact control associated with nomadic herding. With these technologies, the herder needs not move with the cattle within a grazing area, unlike in nomadic herding

¹³ Ibid.

¹⁴ Campbell, Braden. "EShepherd – The Future of Grazing Livestock." OSU Sheep Team. March 19, 2019. Accessed May 01, 2021. <https://u.osu.edu/sheep/2019/03/19/eshepherd-the-future-of-grazing/>.

¹⁵ Butler, Z., P. Corke, R. Peterson, and D. Rus. "Virtual Fences for Controlling Cows." *IEEE International Conference on Robotics and Automation, 2004. Proceedings. ICRA 04. 2004*, 2004. doi:10.1109/robot.2004.1302415.

¹⁶ Stephen B., Michie C., Andonovic I. (2013) Remote Sensing in Agricultural Livestock Welfare Monitoring: Practical Considerations. In: Mukhopadhyay S., Jiang JA. (eds) *Wireless Sensor Networks and Ecological Monitoring. Smart Sensors, Measurement and Instrumentation*, vol 3. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-36365-8_7.

practice in which the herder maintains physical proximity and transits with cattle.

3. Automated versus Manual Processes

In input administration (grazing management) as well as output harvesting (such as milking), while the traditional herder maintains manual human labour-intensive practices, civilization is driving the cattle industry in the direction of automation. Automated milking systems have become more widespread with the proliferation of such technologies as robotics in milking. De Koning (2010) as cited in Rodenburg (2016) highlights this growth in the deployment of robotics in cattle farming.

Robotic milking has gained widespread acceptance, particularly in western Europe, as a way to reduce labor on dairy farms, increase production per cow, and improve the lifestyle of dairy farm families milking 40 to 250 cows (De Koning, 2010).¹⁷

¹⁷ Ibid.

Again, De Koning (2010) and Barkema et al. (2015), as cited in Rodenburg (2016), roll out the numbers in terms of growth of adoption of automated milking practices within six years.

In 2009, the estimated number of robotic dairy farms worldwide was 8,000 (De Koning, 2010). Just 6 years later, Barkema et al. (2015) suggested that this number had more than tripled to 25,000 dairy farms.¹⁸

Megalac Range, a feed producer describes simply how these automated milking systems work.

There are several different types of robotic milking systems. But broadly speaking the process runs thus. Your cow enters a small pen, driven by the desire to relieve udder pressure and nibble on the food that's on offer during milking. As the cow enters the pen, an ID tag is scanned that tells the system when the cow was last milked, how the udder

¹⁸ Ibid.

is shaped and the rate at which each teat dispenses milk.¹⁹

An interesting dynamic in the deployment of these technologies is the successful adaptation of cows to technology-aided systems. Megalac Range describes this adaptive success.

(Cows) don't like change. Consistency is what gives them comfort. That explains why many dairy farmers report that - after a period of readjustment - cows seem to be calmer and happier with robotic milking. They can choose when they are milked and the process is identical each and every time. No frenzied herding into the parlour. No stress. No worries.²⁰

¹⁹ "How Robotic Milking Can Help Dairy Farmers Boost Yields." Megalac. April 5, 2018. Accessed May 01, 2021. <https://www.megalac.com/about/news/158-how-robotic-milking-can-help-dairy-farmers-boost-yields#:~:text=Okay, so how does robotic milking work?&text=As the cow enters the,to let down her milk.>

²⁰ Ibid.

Known as Precision Livestock Farming, these range of techniques have been found to boost productivity in livestock farms.²¹

4. Natural versus Scientifically Aided Forage

Modern cattle herding is characterized by technology-backed human proactivity in key aspects of the value chain including the production and monitoring of grass and foliage. Advancements in grass biotechnology have been deployed in “accelerating forage and turf grass improvement”²². While gene technology can reduce the growth period of grass as well as increase the yield and nutritional value of forage, the availability and adequacy of forage can be modelled and predicted

²¹ Carillo, Felicetta, and Fabio Abeni. "An Estimate of the Effects from Precision Livestock Farming on a Productivity Index at Farm Level. Some Evidences from a Dairy Farms' Sample of Lombardy." MDPI. October 01, 2020. Accessed May 01, 2021. <https://www.mdpi.com/2076-2615/10/10/1781>.

²² Spangenberg, Germán, Zeng-Yu Wang, and Ingo Potrykus. "Biotechnology in Forage and Turf Grass Improvement." *Monographs on Theoretical and Applied Genetics*, November 2001. Accessed May 01, 2021. doi:10.1007/978-3-642-72051-2.

through such technologies as satellite remote sensing,²³ big data²⁴ and artificial intelligence.²⁵

In contrast with this civilizational advancement, an evident dimension of the clash of civilizations in the farmer-herder crisis is the continued modelling of nomadic cattle herding practice around naturally available forage. The nomadic herdsman relies on naturally growing grass and predicts situational availability of grass based on experiential seasonal and geographical patterns. In other words, the nomadic herdsman does not grow grass for his cattle. He moves towards areas where grass or forage would likely be found. In his search for forage, the nomadic Fulani herdsman's migratory instinct is southward, towards

²³ "Remote Sensing." Remote Sensing | Special Issue : Applications of Remote Sensing for Livestock and Grazing Land Management. Accessed May 01, 2021.

https://www.mdpi.com/journal/remotesensing/special_issues/Grazing_Land_Management.

²⁴ Hudson, Tipton D., Matthew C. Reeves, Sonia A. Hall, Georgine G. Yorgey, and J. Shannon Neibergs. "Big Landscapes Meet Big Data: Informing Grazing Management in a Variable and Changing World." *Rangelands*. November 29, 2020. Accessed May 01, 2021.

<https://www.sciencedirect.com/science/article/pii/S0190052820301048>.

²⁵ "Foraging Search: Prototypical Intelligence." University of Washington. Accessed May 01, 2021.

<https://faculty.washington.edu/gmobus/ForagingSearch/Foraging.html>.

Nigeria's remaining rainforests. The accidental or deliberate straying of the herd into cultivated arable land or forest reserves in the nomad's bid to meet the availability, adequacy and accessibility challenge associated with natural forage and open grazing is the cannon fodder for the farmer-herder crisis.

5. Natural versus Artificial Selection

While nomadic herders may practice some measure of selective breeding through physical separation strategies in order to perpetuate certain preferred traits, nomadic cattle rearing relies heavily on inbreeding. As a result, nomadic cattle are offered reduced chances for diversification and improvement of traits across generations. In contrast, modern herding practices nurture greater diversity through better organized and more empirical selective breeding techniques. Furthermore, advances in animal biotechnology provide tools for selection of

traits such as disease resistance²⁶ and enhanced productivity.²⁷

6. Open Versus Barriered Grazing

It is said that the invention of the barbed wire in the nineteenth century effectively ended the era of the cowboy in the United States as barbed wired fences prevented open grazing. Citing relevant historical sources including the US Patent Office, *The History Engine* describes the disruption of the cattle industry in an article titled “Invention of Improved Barbed Wire Changes the West”.

On November 24, 1874, the United States Patent Office issued Patent No.

²⁶ Islam, Md. Aminul, Sharmin Aqter Rony, Mohammad Bozlur Rahman, Mehmet Ulas Cinar, Julio Villena, Muhammad Jasim Uddin, and Haruki Kitazawa. "Improvement of Disease Resistance in Livestock: Application of Immunogenomics and CRISPR/Cas9 Technology." MDPI. November 28, 2020. Accessed May 01, 2021. <https://www.mdpi.com/2076-2615/10/12/2236>.

²⁷ Tait-Burkard, Christine, Andrea Doeschl-Wilson, Mike J. McGrew, Alan L. Archibald, Helen M. Sang, Ross D. Houston, C. Bruce Whitelaw, and Mick Watson. "Livestock 2.0 – Genome Editing for Fitter, Healthier, and More Productive Farmed Animals." *Genome Biology*. November 26, 2018. Accessed May 01, 2021. <https://genomebiology.biomedcentral.com/articles/10.1186/s13059-018-1583-1>.

157124 to Joseph F. Glidden of De Kalb, Illinois. Glidden invented “a new and valuable improvement in wire fences,” with the goal to “preserve cattle from breaking through wire fences.”²⁸

Quoting US historian and Emory University Professor Emeritus, James Roark, *The History Engine* argues that the barbed wire revolutionized the cattle business and “sounded the death knell for the open range.”²⁹

However, this development did not come without undesirable consequences. In addition to fights over land³⁰, “the devil’s rope”, as the barbed wire was called by aggrieved herders, temporarily crashed the cattle market,³¹ thus highlighting the need for a systematic approach that considers other relevant cavities in the rabbit hole.

²⁸ "Invention of Improved Barbed Wire Changes the West." *The History Engine*. Accessed May 07, 2021. <https://historyengine.richmond.edu/episodes/view/6265>. <https://historyengine.richmond.edu/episodes/view/6265>.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ray, Emily and Wynell Schamel. "Glidden's Patent Application for Barbed Wire." *Social Education* 61, 1 (January 1997): 52-55.

Nevertheless, with the barbed wire, arable farming landowners shielded their crops from straying cattle while ranch owners used the technology to demarcate and preserve pasture for their cattle. This development facilitated a form of mergers and acquisition as holders of small herds were compelled by competitive forces to sell their cattle to those who owned ranches and managed pastures.³² Thus, the “invisible hand” of market forces enabled by 19th century innovation went to work to drive the transformation of America’s cattle industry.

In the 21st century, electronic collars and electric fences mark a civilizational milestone that could put an end to the incursion of cattle into farmland. These technologies are beyond the capacity of Nigeria’s and West Africa’s nomadic herdsman and the largely subsistent or small-scale farming populations. However, the situation creates an opportunity which is presented in the solution framework, the GREEN Model.

³² Ibid.

7. Engendered versus Non-gendered Social Structures

When one searches for the word “cowgirl” on Google, every option that emerges relates to the woman-on-top sex position. In contrast, the word “cowboy” on Google’s search engine returns the Wikipedia definition – “an animal herder who tends to cattle...”. This simple expression of male exclusiveness in the cattle industry could make one presume that there are no female herders when, in fact, there are.

Whereas civilization is trending in the direction of female inclusion in previously male dominated roles, from soldiering to space exploration, and while gender neutrality is becoming the norm in work-related environments, the cattle herding vocation among the nomadic Fulanis is heavily gender defined with women relegated to the role of the milk maid and excluded from actual herding. The nomenclature of the trade readily betrays the associated gender restrictions.

There is no doubt that my aunt would have been alive today if she had encountered on her farm a **Fulani herds**woman. Both women might have exchanged pleasant gestures, and each would have gone on with

her respective job. If a cow strayed and disagreement ensued, the women might have slugged it out with harsh words and that might have been all; but the lone woman was helpless among nomadic herdsman from a male dominated culture that relegates the woman to the backend while keeping the men in isolated frontier grasslands for an entire season.

8. Property Ownership versus Terra Nullius

Civilization is not all about technology. It is also about systems of organization, administration and justice. Property rights are an indicator of social sophistication. The farmer-herder crisis is a clash of paradigms in respect of property rights – not of whether those rights exist or not, but of defining the objects in which those rights should primarily inhere. To the nomadic herder, property rights inhere more in his cattle than in the land; hence, when push comes to shove and the survival of cattle is at stake, farmlands may fall in the category of terra nullius (no man's land). Meanwhile, to the farmer, property rights are inherent, not only in the crops, but, in most cases, also in the farmland such that the grazing cattle and their herders are trespassers. A

change in property-ownership paradigm for the nomadic herdsman is essential to resolving the crisis.

9. State boundaries versus Boundless Terrains

Closely associated with the property rights question is the question of boundaries as they apply to the definition of a state in international law. By the provisions of the 1993 Montevideo Convention on the Rights and Duties of a State,

“The state as a person of international law should possess the following qualifications:

- a. a permanent population;
- b. a defined territory;
- c. government; and
- d. capacity to enter into relations with the other states.”³³

Article 1(b) which stipulates the possession of a defined territory as precondition for statehood suggests the

³³ "Montevideo Convention on the Rights and Duties of States." The Faculty of Law. Accessed May 01, 2021. <https://www.jus.uio.no/english/services/library/treaties/01/1-02/rights-duties-states.xml>.

recognition of and respect for boundaries. The state as a system of political organization emerged in 1648 from the Treaty of Westphalia that ended the Thirty Years War in Europe. In Africa, as countries gained independence following the colonial era, the state became the prevailing system of political organization where empires such as the Sokoto Caliphate once held sway. However, state boundaries mean little to the transhumance practice of the Fulani herdsman migrating across West Africa. To the nomadic herdsman, home is where the grass is, irrespective of state boundaries. This boundless construct of territory lags behind the civilizational advancement of the state as a system of political organization.

10. Geopolitical Pluralism versus Ideological Expansionism

The rise of the Sokoto Caliphate in the nineteenth century occurred towards the end of the age of empires when a Fulani administrator and scholar, by name Uthman Dan Fodio, led the jihad that upstaged the Hausa city states which had been host to the Fulanis. The jihad replaced the city states with a Fulani-governed Sokoto Caliphate. That epoch-making

political revolution is not lost on either the Fulani who resides predominantly in the North or the non-Fulani in the Middle Belt and South of Nigeria. To the non-Fulani, it is a historical red flag in the current scheme of interactions, a warning against Fulani conquest and expansionism while, to the Fulani, the same historical event marks a proud history. The transhumance practice of the nomadic Fulani herdsman may be said to have historical and cultural resonance with the age of the Caliphates.

In an era of increasing integration, with the Africa Continental Free Trade Area (ACFTA) set to take off, and the ECOWAS Common Market in view, it would be interesting to experiment on the relative affinity of the nomadic Fulani herdsman on the one hand, and the local West African farmer on the other hand, to regional integration. If the question is put forward to each of these parties in a simple enough format as to whether or not national boundaries within the subregion should be eased or encouraged, our hypothesis is that the Fulani herdsman will be more inclined to regional integration than the farmer, and that the nomadic herdsman's concept of regional integration would have a strong ideological orientation

based on political history and culture. The rejection of Rural Grazing Area (RUGA) settlements or cattle colonies by the farmer-dominated Middle Belt and South of Nigeria is not unconnected to this difference in geopolitical orientation. Our postulation is that, whereas the Fulani herdsman lags in the state construct of civilization, he would likely lead the local Nigerian farmer in the regional integration narrative. This difference in perception as well as the historical background has been a fodder for conflicts.

11. Climate-friendly versus Consumptive Grazing

Due to significant methane production, 14.5 percent of global greenhouse gas emissions are derived from livestock, with cattle contributing 65 percent of livestock-generated emissions.³⁴ Furthermore, overgrazing exacerbates exposure to global warming. Nomadic grazing, by its nature, is a consumptive practice in which forage is exhaustively grazed by cattle in a given space. Upon exhaustion of forage, the herder migrates the cattle to the next available forage area.

³⁴ "Key Facts and Findings." FAO. Accessed May 24, 2021. <http://www.fao.org/news/story/en/item/197623/icode/>.

In contrast, by deploying such practices as silvopasture which combines grass cultivation with tree planting, civilization is heading towards climate friendly livestock management.³⁵ Silvopasture improves biodiversity and facilitates carbon sequestration (the capture and conversion of atmospheric carbon dioxide to root-stored starch through photosynthesis). Modern ranchers are also embracing regenerative pastoralism which seeks to build soil health through such practices as rotational grazing.³⁶ In addition, inclusion of sea weed in cattle feed has been advanced for greenhouse gas emission reduction.³⁷ Nevertheless, while the Civilization Cavity deals with climate change as an effect of nomadic herding, another cavity, the Climate Cavity, deals with climate change as a cause of the farmer-herder crisis.

³⁵ Nargi, Lela. "Silvopasture Can Mitigate Climate Change. Will U.S. Farmers Take It Seriously?" Civil Eats. January 08, 2019. Accessed May 24, 2021. <https://civileats.com/2019/01/07/silvopasture-can-mitigate-climate-change-will-u-s-farmers-take-it-seriously/>.

³⁶ Ibid.

³⁷ Quinton, Amy M. "Feeding Cattle Seaweed Reduces Their Greenhouse Gas Emissions 82 Percent." UC Davis. May 21, 2021. Accessed May 24, 2021. <https://www.ucdavis.edu/news/feeding-cattle-seaweed-reduces-their-greenhouse-gas-emissions-82-percent#:~:text=A bit of seaweed in,the University of California, Davis.&text=“This could help farmers sustainably,the world,” Roque added.>

CHAPTER 4: THE CLIMATE CAVITY

By locating climate as one of three factors in a “Catastrophic Convergence”, Christian Parenti’s *Tropic of Chaos: Climate Change and the New Geography of Violence* models the multidimensional nature of the crisis emanating from farming and pastoralist activities across the tropics. *Tropic of Chaos* is introduced with the story of Ekaru Loruman who is killed by cattle rustlers as a result of the convergence of three factors, namely, poverty induced by western liberalization, violence as a legacy of the Cold War, and drought resulting from climate change.³⁸ This brings us to the Climate Cavity as we unravel Nigeria’s and West Africa’s farmer-herder crisis.

The Climate Risk Profile for West Africa by the United States Agency for International Development reports historical changes in climate for Africa to include:

...higher temperatures; increased rainfall in some areas and reduced

³⁸ YouTube. June 28, 2018. Accessed May 01, 2021.

<https://www.youtube.com/watch?v=RIOK4-IBIFY>; see also Parenti, Christian. 2011. *Tropic of Chaos: Climate Change and the New Geography of Violence*. New York: Nation Books.

rainfall in others, with high interannual and interdecadal variability, particularly in the Sahel; increased frequency of heavy rainfall events; and rising sea levels³⁹

Specifically, the observations made in the USAID report include the following:

- a. a rise in temperature of between +0.5 to 0.8°C, regionally between 1970 and 2010, “slightly higher than the global average”;
- b. increase in temperature of +1.5 to 2.0°C in the Sahel between 1950 and 2010; and
- c. greater reduction in quantity of rainfall in the western parts of West African Sahel than in the eastern parts.⁴⁰

The report also presents climate change projections by 2050 under the Adaptation Thought Leadership and Assessments (ATLAS) project. The projections include temperature rise of between 1.6 and 2.9°C by 2050 as

³⁹ "Climate Risk Profile: West Africa Fact Sheet." USAID, 4. Accessed May 05, 2021.

https://www.climatelinks.org/sites/default/files/asset/document/West_Africa_CRP_Final.pdf.

⁴⁰ Ibid.

well as a decrease in rainfall in the west of the region and an increase in the east. Based on these projections, the temperature climate stressors in the Sahel will result in reduced livestock production, reduced growth rate as well as reduced milk production. The report further projects that rainfall stressors will result in “increased conflict between pastoralists and farmers due to expanding cultivation and altered pasture mobility patterns”⁴¹

With the western parts of the Sahel more susceptible than the eastern areas, the migration of the nomadic Fulani herdsman in a quest for forage is expectedly southward and eastward. The transhumance from Nigeria’s western neighbours towards the Middle Belt and South has thus exacerbated clashes with farmers. The shrinking of the Lake Chad due, in part, to climate change,⁴² has been further identified as intensifying the farmer-herder crisis.⁴³

⁴¹ Ibid, 7.

⁴² Gao, H. J., T. C. Bohn, E. P. Podest, K. Undefined Mcdonald, and D. Undefined Lettenmaier. "On the Causes of the Shrinking of Lake Chad." *Environmental Research Letters* 6, no. 3 (2011). doi:10.1088/1748-9326/6/3/034021.

⁴³ Obaji, Philip, Jr. "Recharging Lake Chad Key to Ending the Conflict Between Nigeria's Farmers and Herders - Nigeria." ReliefWeb. September

CHAPTER 5: THE CONFLICT CAVITY

The intersection of clashes, namely, the clash of careers, the clash of cultures, and the clash of civilizations within the crucible of climate change and other factors that will be unveiled as we dig further down the rabbit hole, is the substructure of a protracted conflict that has left trails of deaths, destructions, and displacements. It is a multifaceted conflict pitching nomadic Fulani herdsman against native farmers across Nigeria. Occasionally, this conflict, which has an interethnic trunk, also manifests an interreligious branch. While verified data may be in want, reports indicate that, since 1999, violent farmer-herder conflicts in Nigeria have killed 19,000 and displaced hundreds of thousands.⁴⁴

Although incidents may vary, there is a universal nature of conflicts. Every conflict is spurred by differences in the evaluation of a shared situation and in the

05, 2018. Accessed May 03, 2021.

<https://reliefweb.int/report/nigeria/recharging-lake-chad-key-ending-conflict-between-nigeria-s-farmers-and-herders>.

⁴⁴ "Herder-farmer Conflicts in Nigeria." Wikipedia. April 14, 2021. Accessed May 03, 2021. https://en.wikipedia.org/wiki/Herder-farmer_conflicts_in_Nigeria#cite_ref-6.

expectations that one party has of the other. The nomadic herder's situational assessment, shaped by his career, cultural, and civilizational orientation, is in conflict with that of the farmer. In addition to the effect of resource competition (which is discussed in a subsequent chapter), the degeneration into violence results from the inability of the interested parties (sometimes due to the unwillingness of one of the parties) or a neutral arbiter to address the evaluational and expectational differences early enough.

In my introductory story involving the sad demise of my aunt, the conflict dimension of the rabbit hole was encountered in two stages, the "before" and "after" stages. The first conflict dimension occurred prior to the act of violence meted on my aunt by the herdsmen while the second dimension occurred after the act itself. It is likely that my aunt and the other woman who were victims of this violent attack had challenged the herdsmen whose cows may have strayed into the farmlands - this would be the 'before' dimension of the conflict which resulted from differences in situational evaluation and expectations. My aunt may have rightly adjudged the herdsmen trespassers on her farmland while the herdsmen may have viewed the arable crops

as forage. Furthermore, my aunt may have expected the herdsmen to simply herd their cattle off her farmland while the herdsmen may have expected her to allow them graze, ignoring or not accepting the fact that this was private property belonging to another. This pre-incident conflict of evaluations and expectations would snowball into a post-incident conflict of ethnic proportions - the “after” dimension.

On a broader sociocultural scale, this evaluational and expectational viewpoint of the herdsmen may have been further informed by historical grievances. In an interview published in *Vanguard*, a Nigerian newspaper, Baba Othman Ngelzarma, National Secretary, Miyetti Allah Cattle Breeders Association of Nigeria (MACBAN), an association which promotes the welfare of Fulani herdsmen in Nigeria, hinted on this historical grievance:

You see, these clashes came as a result of the absence of developed grazing reserves and the protection of those reserves. These are areas that have suffered a lot of neglect because the pastoralists’ livelihood has been

frequently undermined by unfriendly policies and laws. The policies of the past administrations have given more attention to agronomy and not the livestock sub-sector. That is what has caused this problem. This is a consequence of the neglect of this long-term sector of the economy... (We) have about three million hectares which have been destroyed...⁴⁵

In contrast, other sociocultural groups adjudge the situation a deliberate and calculated territorial conquest and expansionist ploy by the Fulanis. This position was advanced by late Mr Yinka Odumakin, a prominent civil rights activist and former National Secretary of Afenifere, a sociocultural organization of the Yorubas, the dominant group in Nigeria's South-West.

The killings targeted at non-Fulani groups across the country are willful and

⁴⁵ Vanguard. "Our Story, by Fulani Herdsmen." Vanguard News. April 30, 2016. Accessed May 15, 2021.
<https://www.vanguardngr.com/2016/05/story-fulani-herdsmen/>.

deliberate in pursuit of expansionist and conquest agenda.⁴⁶

The interethnic tension and the eviction notices issued by ethno-cultural associations in Nigeria across the North-South divide, such as the eviction notice by Yoruba activist, Sunday Adeyemo (popularly known as Sunday Igboho), to Fulani herdsmen in Yoruba territories,⁴⁷ and the counterthreats by Fulani activist, Umar Labdo⁴⁸, are all a result of these differences in situational evaluation and expectations.

⁴⁶ Oluwole, Josiah. "Afenifere Echoes Obasanjo's Fulanisation Allegation, Says Herdsmen's Onslaught Deliberate, Willful." Premium Times Nigeria. May 27, 2019. Accessed May 03, 2021.

<https://www.premiumtimesng.com/regional/ssouth-west/332003-afenifere-echoes-obasanjos-fulanisation-allegation-says-herdsmens-onslaught-deliberate-willful.html>.

⁴⁷ Kazeem Ugboaga. "Sunday Igboho's Eviction Notice to Fulani Herdsmen Illegal – Falana." P.M. News. January 28, 2021. Accessed May 15, 2021.

<https://www.pmnewsnigeria.com/2021/01/28/sunday-igbohohos-eviction-notice-to-fulani-herdsmen-illegal-falana/>.

⁴⁸ "Quit Notice: We'll Banish Yoruba from the North If..." The Sun Nigeria. January 29, 2021. Accessed May 03, 2021.

<https://www.sunnewsonline.com/quit-notice-well-banish-yoruba-from-the-north-if/>.

CHAPTER 6: THE CRIME CAVITY

In the context of Nigeria's farmer-herder crisis, whereas conflict is the atmosphere of violent interactions between Fulani herders and local farmers across communities, crimes are lawless acts associated with the conflictual atmosphere. Identifiable criminal acts have often accompanied these conflicts. In the sad story of my aunt, sandwiched between the 'pre-incident' and 'post-incident' conflict was a heinous criminal element.

There is an unmistakable criminal enterprise associated with the farmer-herder crisis, with the criminals perpetrating crimes such as rape, murder, kidnapping, arson and theft. The criminality associated with this crisis has a local or community dimension and is experienced by both farming and herding communities as reported by Bagu and Smith (2007) in *Past is Prologue: Criminality and Reprisal Attacks in Nigeria's Middle Belt*:

Gangs of criminals, often youth from farming and herding communities and/or local bandits, take advantage of growing insecurity, fear, and cyclical

attacks to loot villages, engage in highway robbery, and rustle cattle for personal gain. Both farming and herding communities suffer from this criminality...⁴⁹

These local or community-based criminal gangs have been reported in different states across northern Nigeria, thus exerting migratory pressure and intergroup tensions southward.

In Northwest Nigeria, criminal gangs are reportedly engaging in organized rural banditry to profit off livestock theft and trade, leading to the displacement of the local (predominantly Muslim) population and livestock theft forcing them to migrate southward...⁵⁰

With the proliferation of terrorism, crime and insecurity across the subregion, such local incidences of criminality have been iterated across West Africa.

⁴⁹ Bagu, Chom, and Katie Smith. "Past Is Prologue: Criminality and Reprisal Attacks in Nigeria's Middle Belt." SFCG, Search for Common Ground. 2017, 5. Accessed May 03, 2021. https://www.sfcg.org/wp-content/uploads/2017/04/Criminality-Reprisal-Attack_FINAL.pdf.

⁵⁰ Ibid.

According to a 2005 report of the United Nations Office of Drug and Crime (UNODC), such criminal gangs have been found to have affiliations with rogue elements in the regular armed forces of the respective countries and to have built cross-country networks.

Some criminal gangs in northern Nigeria have included demobilized ex-combatants from neighbouring countries. In Sierra Leone too, demobilized fighters are recorded as forming armed gangs... Some such groups may receive arms from the regular armed forces. They may sell stolen goods in neighbouring countries, and are also reported to have developed connections as far away as Gambia, Mali and Côte d'Ivoire...They are involved in cattle-rustling, smuggling and armed robbery.⁵¹

⁵¹ "Transnational Organized Crime in the West African Region." United Nations. 2005, 30-31. Accessed May 08, 2021. https://www.unodc.org/pdf/transnational_crime_west-africa-05.pdf.

Cases of kidnapping for ransom reported across Nigeria, characterized by the abduction of farmers, villagers, travellers, and school children have also been associated with the activities of criminal herdsmen or “bandits”, a word loosely used for “kidnappers, armed robbers, cattle rustlers, Fulani herdsmen and other armed militia”.⁵²

Even as foreign (non-Nigerian) herdsmen⁵³ have been increasingly fingered in the atrocities associated with Fulani herdsmen, nomadic cattle breeding has been identified as facilitating such criminal activities.

(The) nomadic type of cattle breeding is a hindrance to the fight against the menace; moving cattle herds from one locale to another is common and provides a perfect cover for rustlers. Finally, revenue from the illegal

⁵² Orjinmo, Nduka. "Nigeria's School Abductions: Why Children Are Being Targeted." BBC News. March 02, 2021. Accessed May 03, 2021. <https://www.bbc.com/news/world-africa-56212645?piano-modal>.

⁵³ Vanguard. "Foreign, Armed Fulani Herders Trooping into Oyo - GEN. TOGUN." Vanguard News. January 15, 2021. Accessed May 03, 2021. <https://www.vanguardngr.com/2021/01/foreign-armed-fulani-herders-trooping-into-oyo-gen-togun/>.

slaughtering and sale of meat
contribute to the rise in cattle rustling.⁵⁴

The criminal dimension of Nigeria's farmer-herder crisis has resulted in a victim-perpetrator scenario for the nomadic herdsman. On the one hand, nomadic herders, themselves, are victims of violent crimes. The Governor of Nigeria's Bauchi State came under fire recently when he argued that Fulani herdsman bear AK-47 rifles as a self-defence mechanism against the threats of cattle rustling and banditry.⁵⁵ On the other extreme, the armed herdsman has become a perpetrator of crime, killing, raping, and maiming local farming populations while looting and destroying property.

As we proceed on this rabbit chase, it is interesting to point out that the Crime Cavity in the rabbit hole is

⁵⁴ Koroma, Alphaeus, Boubacar Daouda Diallo, Alioune Badara Gueye, and Moses Udo Ikoh. "The Impact of Organized Crime in West Africa." Edited by Etannibi E.O. Alemika, 36. Friedrich Ebert Stiftung. August 2013, 66. Accessed May 08, 2021. <https://library.fes.de/pdf-files/bueros/nigeria/10199.pdf>.

⁵⁵ "Governor Mohammed Explains Comments on Herders Carrying Ak-47 Rifles for Self Defence." The Guardian Nigeria News - Nigeria and World News. February 15, 2021. Accessed May 08, 2021. <https://guardian.ng/news/governor-mohammed-explains-comments-on-herders-carrying-ak-47-rifles-for-self-defence/>.

historically poignant because the oldest crime as reported in the Bible is associated with conflict between a farmer (Cain) and a herder (Abel). The murder of Abel by Cain was the murder of a herder by a farmer.⁵⁶

Nevertheless, although ancient in manifestations, crime is not the root of the farmer-herder crisis. The criminal element in the crisis is motivated by a factor which we will examine further down the rabbit hole – the Competition Cavity; but before we bore into the Competition Cavity, let us stop by two more cavities, the first of which is an annex of the crime dimension, the Conspiracy Cavity.

⁵⁶ See Chapter 4 of the Book of Genesis

CHAPTER 7: THE CONSPIRACY CAVITY

In law, a conspiracy is described as “an agreement between two or more people to behave in a manner that will automatically constitute an offence.”⁵⁷ Put simply, a conspiracy exists “when people work together by agreement to commit an illegal act.”⁵⁸ Furthermore, “a conspiracy may exist when the parties use legal means to accomplish an illegal result.”⁵⁹ The criminal component of the farmer-herder crisis bears the imprint of a cross-boundary conspiracy with gunrunners and terror networks linked to a story of crime and terror.

The story begins in Algeria in 1992 when the military government annulled an election that the Islamic Salvation Front (FIS) seemed poised to win. The civil war that broke out as a result produced several jihadist groups. Among these, the Salafist Group for Preaching and Combat (GSPC), a Tuareg insurgent group,

⁵⁷ "conspiracy." Oxford Reference. Accessed May 03, 2021.

<https://www.oxfordreference.com/view/10.1093/acref/9780199551248.001.0001/acref-9780199551248-e-814?rskey=QRL3PN&result=863>.

⁵⁸ "Legal Dictionary - Law.com." Law.com Legal Dictionary. Accessed May 03, 2021.

<https://dictionary.law.com/Default.aspx?searched=conspiracy&type=1>.

⁵⁹ Ibid.

sustained the insurgency even after the civil war, using Mali as an external base. In 2007, GSPC pledged allegiance to Al Qaeda and became Al Qaeda in the Maghreb (AQIM).

Then came the Arab Spring in the early 2010s, beginning in Tunisia where street vendor, Mohamed Bouazizi, set himself on fire and became the catalyst for a revolution that would spread across the Arab world. In Tunisia, the protests would oust Zine El Abidine Ben Ali who had been in power for 22 years. In Egypt, the revolution ousted Hosni Mubarak, paving the way for the Muslim Brotherhood to win elections and form a government that was soon overthrown by the military. The military then transmogrified itself into a civilian dictatorship.

The story then leads to Libya where 400,000 to 1,000,000 Kalashnikovs or AK-47 rifles had been stockpiled across the country by Colonel Muammar Gaddafi to be distributed to militias in the event of a war.⁶⁰ However, the revolutionary fervour resulted in

⁶⁰ Marsh, Nicholas. "Brothers Came Back with Weapons: The Effects of Arms Proliferation from Libya." PRISM | National Defense University. May 16, 2017. Accessed May 03, 2021. <https://cco.ndu.edu/PRISM-6->

the killing of Muammar Gaddafi. With the collapse of state structures in Libya, Tuareg mercenaries from Mali who had migrated to Libya to fight on the side of the Libyan dictator gained access to the stockpile of small arms and light weapons, including the AK-47s, and fled back to northern Mali⁶¹ with a cache of arms to become part of the National Movement for the Liberation of Azawad (MNLA).⁶²

In Central Mali, confronted with Tuareg aggression, Amadou Koufa⁶³, a Fulani who had been an affiliate of AQIM, created the Macina Liberation Front and recruited local Fulanis. Amadou Koufa then went on to spread jihadi ideas among the Fulanis, taking advantage of perceived unfairness and neglect of the Fulani herders in government policy with respect to the

4/Article/1171858/brothers-came-back-with-weapons-the-effects-of-arms-proliferation-from-libya/.

⁶¹ Patrick, Stewart M. "Collateral Damage: How Libyan Weapons Fueled Mali's Violence." Council on Foreign Relations. January 29, 2013. Accessed May 03, 2021. <https://www.cfr.org/blog/collateral-damage-how-libyan-weapons-fueled-malis-violence>.

⁶² Boukhars, Anouar. "How West Africa Became Fertile Ground for AQIM and ISIS." World Politics Review. November 29, 2016. Accessed May 03, 2021. <https://www.worldpoliticsreview.com/articles/20556/how-west-africa-became-fertile-ground-for-aqim-and-isis>.

⁶³ "Amadou Koufa." United Nations. Accessed May 03, 2021. <https://www.un.org/securitycouncil/content/amadou-koufa>.

struggle for resources with arable farmers. Further aggrieved by the killing of Fulani herdsmen and the rustling of cattle by Tuaregs,⁶⁴ the Macina Liberation Front mobilized Fulanis to defend themselves. Then, in 2017, the Macina Liberation Front and a host of other jihadi groups merged to form the Group for the Support of Islam and Muslims (GSIM) which has been described as the most powerful jihadi group in the Sahel.⁶⁵

The rise of killer herdsmen in Nigeria appears to bear this imprimatur of a five-factor trigger which includes a struggle for land and water resources, perception of unfair treatment of herdsmen of Fulani extraction in public policy, infiltration by foreign radicalized herdsmen from neighbouring countries in the Sahel, radicalization of local herdsmen by foreign herdsmen who take advantage of the perception of unfairness,

⁶⁴ Cissé, Modibo Ghaly. "Understanding Fulani Perspectives on the Sahel Crisis – Africa Center." Africa Center for Strategic Studies. April 22, 2020. Accessed May 03, 2021. <https://africacenter.org/spotlight/understanding-fulani-perspectives-sahel-crisis/>.

⁶⁵ Lounnas, Djallil. "The Transmutation of Jihadi Organizations in the Sahel And the Regional Security Architecture." Menara Project. April 10, 2018, 2-6. Accessed May 03, 2021. https://www.iai.it/sites/default/files/menara_fn_10.pdf.

and an access to arms reportedly traceable to Libya among other sources.⁶⁶

Reports indicate that some of the marauding AK-47 bearing herdsmen that have wreaked havoc in Nigeria are foreigners.⁶⁷ Taking into consideration factors such as the transhumance of Fulani herdsmen across West Africa as well as the porous borders of Sahelian African countries, there are allegations that the ideas⁶⁸ that radicalized the Fulani in neighbouring countries such as Mali, Burkina Faso and Niger have spread into Nigeria,

⁶⁶ Sobowale, Rasheed. "Herdsmen Weapons Supplied from Côte D'Ivoire, Libya, Turkey —Report." Vanguard News. January 31, 2020. Accessed May 03, 2021. <https://www.vanguardngr.com/2020/01/herdsmen-weapons-supplied-from-cote-divoire-libya-and-turkey—report>.

⁶⁷ "Bandits, Criminal Herdsmen Are Not Nigerians - FG." Vanguard News. February 21, 2021. Accessed May 03, 2021. <https://www.vanguardngr.com/2021/02/bandits-criminal-herdsmen-are-not-nigerians-fg/>.

⁶⁸ Cissé, Modibo Ghaly. "Understanding Fulani Perspectives on the Sahel Crisis – Africa Center." Africa Center for Strategic Studies. April 22, 2020. Accessed May 03, 2021. <https://africacenter.org/spotlight/understanding-fulani-perspectives-sahel-crisis/>.

thus regionalizing the crisis⁶⁹ with an alleged “Fulanization” agenda⁷⁰.

As the influx of foreign elements stirs up allegations of conspiratorial collusion with local traditional and civil authorities,⁷¹ the dynamics of agelong peaceful relations and conflict resolution mechanisms between the Nigerian Fulani and local communities⁷² have come under threat. Although the “alleged Fulanization” agenda was brought into mainstream Nigerian political discourse by former President Olusegun Obasanjo in 2019, his political and military contemporary, General Theophilus Danjuma had stirred the hornet’s nest a

⁶⁹ <https://www.frstrategie.org/en/programs/observatoire-du-monde-arabo-musulman-et-du-sahel/fulani-people-and-jihadism-sahel-and-west-african-countries-2019>

⁷⁰ "Unedited: Full Text of Ex-President Obasanjo's 'fulanization' Speech That Is Shaking Nigeria." Ripples Nigeria. May 23, 2019. Accessed May 03, 2021. <https://www.ripplesnigeria.com/unedited-full-text-of-ex-president-obasanjos-fulanization-speech-that-is-shaking-nigeria/>.

⁷¹ Vanguard. "Foreign, Armed Fulani Herders Trooping into Oyo - GEN. TOGUN." Vanguard News. January 15, 2021. Accessed May 03, 2021. <https://www.vanguardngr.com/2021/01/foreign-armed-fulani-herders-trooping-into-oyo-gen-togun/>.

⁷² "The Fulani: An AFP Special Investigation." AFP.com. August 09, 2019. Accessed May 03, 2021. <https://www.afp.com/en/inside-afp/fulani-afp-special-investigation>.

year earlier when he alleged⁷³ a collusion with killer herdsmen by the army and police, a narrative that was rejected by the army.⁷⁴

Without the seal of official intelligence or verifiable data, the allegations of collusion or a grand design are readily classified as conspiracy theories. These allegations place a research demand on unbiased analysts, investigators and intelligence agencies. Declassified official reports by credible national and international agencies are required to provide clarity in this regard. Without such transparent information management, these allegations could be deployed by partisan politicians to create a new dimension of the farmer-herder crisis - the politicisation of the crisis. This takes us to the Campaign Cavity in which we have to deal with the impact of political messaging on the crisis.

⁷³ Afolabi, Ayodele, Isa Abdulsalami Ahovi, and Charles Akpeji. "Army Biased over Herdsmen Killings, Alleges Danjuma." *The Guardian Nigeria News - Nigeria and World News*. March 24, 2018. Accessed May 08, 2021. <https://guardian.ng/news/army-biased-over-herdsmen-killings-alleges-danjuma/>.

⁷⁴ Jimoh, Azimazi Momoh. "Army Faults Danjuma's Stance, Moves against Illegal Arms' Bearers." *The Guardian Nigeria News - Nigeria and World News*. March 26, 2018. Accessed May 08, 2021. <https://guardian.ng/news/army-faults-danjumas-stance-moves-against-illegal-arms-bearers/>.

CHAPTER 8: THE CAMPAIGN CAVITY

The Campaign Cavity is an outflow of the Conspiracy Cavity. While some analysts⁷⁵ locate the political alongside the ethnic and religious under the emblem of conspiracy theories, this rabbit chase takes the politics of the crisis beyond the Conspiracy Cavity and locates it in a separate cavity because it pertains to the active deployment of the crisis towards political ends. Consequently, in the Campaign Cavity, there are three crevices hosting three categories of actors, namely, the Campaigners, the (alleged) Creators and the Conciliators.

The Campaigners are those who actively shape or deploy the narrative of the crisis as part of political communication strategy. Some actors in the Campaign Cavity base their allegations on certain insider information not readily available to the public.

⁷⁵ Frank. N. Enor, Stephen E. Magor, and Charles E. Ekpo. (2019). "Contending Perspectives and Security Implications of Herdsmen Activities in Nigeria." *International Journal of Research - Granthaalayah*, 7(7), 265-286. <https://doi.org/10.5281/zenodo.3358136>.

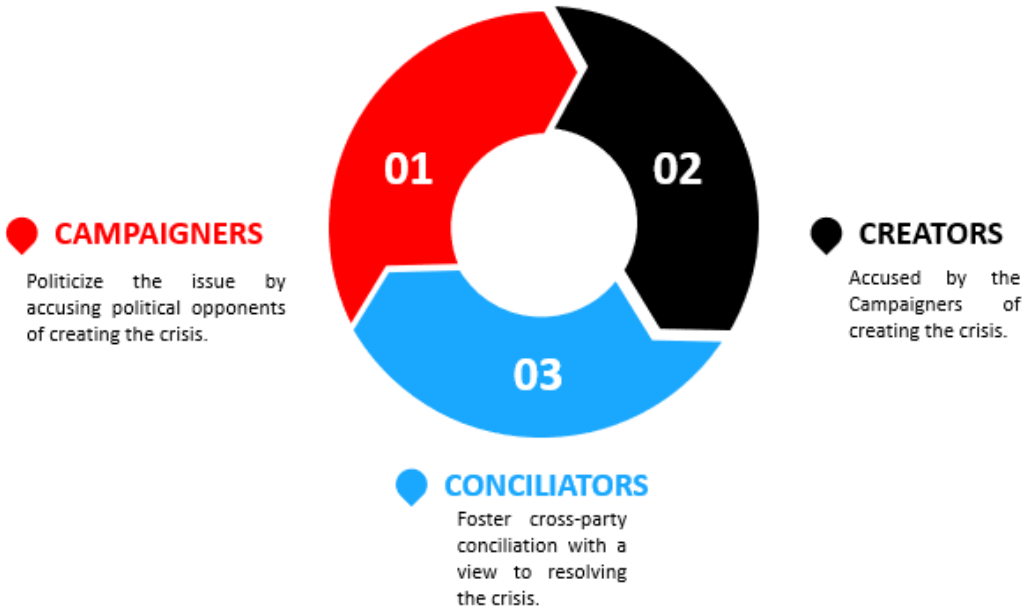


Figure 2: The 3 Crevices of the Campaign Cavity

For instance, during the 70th birthday anniversary of Abubakar Kawu Baraje, while raising questions as to the cause of the seemingly sudden violent turn of the Fulani herdsmen, and while querying the sources of their guns, the former Chairman of the People’s Democratic Party (PDP) alleged that the marauding herdsmen were foreigners brought into Nigeria by the

All Progressives Congress (APC) for the purpose of the 2015 elections.⁷⁶ The PDP chieftain, in this case, played the role of a Campaigner. Conversely, a September 2019 article, written in defence of the APC and President Muhammadu Buhari, cites a report allegedly published by a certain “Centre for Diplomacy and Democracy, Washington DC, USA” (whose online presence could not be proven at the time of writing this piece) and signed by one Ms Catherine Kerigun whose identity could not be readily verified). The article described the upsurge in the Fulani herdsmen crisis as a “game plan” of Alhaji Atiku Abubakar who was presidential candidate of the PDP at the 2019 elections. This pro-APC report was the Campaigner in this case.⁷⁷

The alleged Creators are those who reportedly set the stage for the activities of the marauding herdsmen and

⁷⁶ "Insecurity: APC Imported Fulani Herdsmen for 2015 Election, Baraje Alleges -." The NEWS. February 04, 2021. Accessed May 03, 2021. <https://www.thenewsnigeria.com.ng/2021/02/04/insecurity-apc-imported-fulani-herdsmen-for-2015-election-baraje-alleges/>.

⁷⁷ Agila, Okanga. "Nigeria: Fulani/Farmers Crisis and the End of Hypocrisy." Vanguard News. September 19, 2019. Accessed May 03, 2021. <https://www.vanguardngr.com/2019/09/nigeria-fulani-farmers-crisis-and-the-end-of-hypocrisy/>; see also "APC Supporting 'killer' Fulani Herdsmen – Ekiti PDP." Blueprint Newspapers Limited. February 13, 2018. Accessed May 03, 2021. <https://www.blueprint.ng/apc-supporting-killer-fulani-herdsmen-ekiti-pdp/>.

the foreign elements among them. In the instance cited above⁷⁸ where the PDP chieftain played the role of the Campaigner, the APC was alleged to be the “Creator”. These and similar allegations are sustained by perceptions that the APC government of President Muhammadu Buhari has not sufficiently addressed the crisis.⁷⁹ Conversely, in the Vanguard article cited in the preceding paragraph in which the opinion reflected the position of a Campaigner, the PDP’s Alhaji Atiku Abubakar was the alleged “Creator” of the crisis with the pro-APC article accusing the former Vice President of threatening to make Nigeria ungovernable.⁸⁰

The Conciliators are those who seek to balance perspectives by carefully positioning their views on the crisis on a politically moderate location on the

⁷⁸ "Insecurity: APC Imported Fulani Herdsmen for 2015 Election, Baraje Alleges -." The NEWS. February 04, 2021. Accessed May 03, 2021. <https://www.thenewsnigeria.com.ng/2021/02/04/insecurity-apc-imported-fulani-herdsmen-for-2015-election-baraje-alleges/>.

⁷⁹ Nwaiwu, Chimaobi. "APC Government Interested Only in Enthroning Hausa/Fulani Supremacy - IPOB." Vanguard News. June 29, 2020. Accessed May 03, 2021. <https://www.vanguardngr.com/2020/06/apc-govt-interested-only-in-enthroning-hausa-fulani-supremacy-ipob/>.

⁸⁰ Agila, Okanga. "Nigeria: Fulani/Farmers Crisis and the End of Hypocrisy." Vanguard News. September 19, 2019. Accessed May 03, 2021. <https://www.vanguardngr.com/2019/09/nigeria-fulani-farmers-crisis-and-the-end-of-hypocrisy/>.

spectrum. The Conciliators include Chief Steven Lawani, a chieftain of the APC and former Deputy Governor of Benue State. In his view, “when the Fulanis attack, they don’t ask if you are APC or PDP”⁸¹. Needless to say, the politicisation of the crisis weakens institutional capacity to respond and threatens the much-needed coordination of efforts across partisan divides.

⁸¹ "When the Fulanis Attack, They Don't Ask If You Are APC or PDP." THISDAYLIVE. February 24, 2021. Accessed May 03, 2021. <https://www.thisdaylive.com/index.php/2021/02/25/when-the-fulanis-attack-they-dont-ask-if-you-are-apc-or-pdp/>.

CHAPTER 9: THE COMPETITION CAVITY

As our rabbit chase proceeds to the next cavity, we will find that, at its heart, the problem in question is an outcome of competition between the nomadic herdsman and the farmer, a competition for resources, especially land and water resources. Whereas these resources host and facilitate the growth of forage for cattle, the same resources serve the farmer as factors of arable crop production. However, the competition cavity reserves even more intricate crevices.

From a biological perspective, interesting discoveries may be unveiled when the farmer-herder crisis is viewed through the lens of ecosystem interactions. There are three main kinds of interactions among the biotic or living components of an ecosystem including individual species and whole populations. These interactions are Competition, Predation and Symbiosis.

Competition in biological ecosystems has been defined as “a relationship between organisms in which one is harmed when both are trying to use the same resource related to growth, reproduction, or survivability”⁸² due

⁸² "Competition." Biology Dictionary. October 07, 2018. Accessed May 03, 2021. <https://biologydictionary.net/competition/>.

to scarcity of resources. This captures the struggle between the farmer and the herder for land and water resources. A typical case in point is the alleged expansion of the land reported to have been granted herdsman as grazing reserve in Laduga in Southern Kaduna. According to respondents in a report by *The Sun*, a Nigerian newspaper, the project, which reportedly commenced in the 1980's with 35,000 hectares, was gradually expanded by the Fulani herders to about 140,000 hectares amidst clashes with the farming population.⁸³

On the other hand, the reported encroachment of farming populations into grazing reserves established by the federal government in the 1960s has also deprived nomadic herders of grazing routes. According to reports, "most of the 415 grazing reserves established by the northern regional government in the 1960s have since been lost"⁸⁴. While hundreds were

⁸³ Ebije, Noah. "Unending Controversy over FG's Ruga Initiative." *The Sun Nigeria*. July 14, 2019. Accessed May 03, 2021.

<https://www.sunnewsonline.com/unending-controversy-over-fgs-ruga-initiative/>.

⁸⁴ "Herders against Farmers: Nigeria's Expanding Deadly Conflict." *Crisis Group*. March 18, 2021. Accessed May 03, 2021.

<https://www.crisisgroup.org/africa/west-africa/nigeria/252-herders-against-farmers-nigerias-expanding-deadly-conflict>.

lost to the failure to document or gazette the reserves with a view to preventing encroachment, others have been lost to “rapid population growth and the associated demand for farmland” as well as urbanization and private commercial interests.

This brings into focus an emerging crevice in the Competition Cavity – a symbolic dimension of “intraspecies” competition. Whereas the competition between farmers and herders is analogous to interspecies competition in a biological ecosystem, the rise of large-holder herders in the cattle business portends elements of intraspecies competition in relation to the nomadic smallholder herder. As more private investors engage in modernized cattle breeding, the nomadic cattle owner becomes an endangered “species” on the receiving end of the selection pull of civilization.

Disadvantaged in the competition dynamics of the ecosystem in terms of access to resources as well as the selective impact of public policy, the nomadic herder has taken to predation as an adaptation mechanism. The recourse to violent attacks on farming communities is the herdsman’s adaptation in a

socioeconomic space constrained by severe selection pressures and defined by the survival of the fittest. As our rabbit chase leads us to solutions, we will find that the quest for effective resolution of the farmer-herder crisis is a quest to redirect selection pressures in favour of symbiosis as against predation as the preferred adaptation mechanism; but first, it is imperative to state that the relative disadvantage of the nomadic herdsman is attributable to another cavity in the rabbit hole – the Capital Cavity.

CHAPTER 10: THE CAPITAL CAVITY

Relevant reports lend credence to the profitability of the Nigerian cattle industry. According to data from the Food and Agricultural Organization (FAO), 3,187,316 cows were slaughtered in Nigeria in 2019 while milk production in the same year was put at 523,599 tonnes.⁸⁵ Going by current practices and the attendant limitations, the cattle population in Nigeria is projected at 53.6 million⁸⁶ by 2050. As of 2019, the dairy import bill was put at 1.3 billion dollars annually⁸⁷ while the annual meat consumption was put at 360,000 tonnes per year.⁸⁸ With the country's rising population

⁸⁵ FAOSTAT. Accessed May 04, 2021.

<http://www.fao.org/faostat/en/#data/QL>.

⁸⁶ Simona Varrella. "Nigeria: Livestock Population in Nigeria 2012-2050." Statista. November 03, 2020. Accessed May 04, 2021.

<https://www.statista.com/statistics/1131581/current-and-projected-livestock-population-in-nigeria/>.

⁸⁷ Okojie, Josephine. "How Nigeria Can Bridge \$1.3bn Annual Dairy Import." Businessday NG. July 08, 2019. Accessed May 04, 2021.

<https://businessday.ng/agriculture/article/how-nigeria-can-bridge-1-3bn-annual-dairy-import/>.

⁸⁸ "Hunger for Beef Offers Rewards and Risks for Nigeria's Pastoralists." Vanguard News. June 26, 2019. Accessed May 04, 2021.

<https://www.vanguardngr.com/2019/06/hunger-for-beef-offers-rewards-and-risks-for-nigerias-pastoralists-.2/#:~:text=According%20to%20government%20estimates%2C%20Nigeria,epected%20to%20quadruple%20by%202050.>

projected at 410 million by 2050, and with the prospects of a diversified economy, the Nigerian cattle industry promises to be a huge market. However, this attractive industry potential is contingent upon the modernisation of the cattle industry.

Cattle ranching is a cost intensive business with costs well beyond the reach of the average Nigerian cattle owner. In addition to the cost of obtaining the first set of cattle, the basic suggested cost components for ranching include land, land preparation, homestead fencing, watering facilities, tools and equipment, shelter, labour, insurance and marketing costs,⁸⁹ as well as machinery and vehicles.⁹⁰ At an average estimate of about 1.8 acres per cow⁹¹, a medium-sized ranch of about 360 acres could host about 200 cows.

⁸⁹ "How to Start a Cattle Ranch Business." HowToStartAnLLC.com. October 22, 2020. Accessed May 04, 2021. <https://howtostartanllc.com/business-ideas/cattle-ranch#:~:text=Cattle ranchers>.

⁹⁰ Holmgren, Lyle, and Dillon Feuz. "2015 Costs and Returns for a 200 Cow, Cow-Calf Operation, Northern Utah." March 2015. Accessed May 04, 2021. https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1716&context=extension_curall.

⁹¹ "Balancing Your Animals with Your Forage: Small Scale Solutions for Your Farm." United States Department of Agriculture, 1-4. Accessed May 13, 2021. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1167344.pdf.

The starting cost of starting a medium sized ranch has been projected at about 650,000 dollars⁹², which translates to over 265 million naira in current value. As of 2015, the annual operating cost for such a medium-sized ranch in the United States was estimated at about 140,000 dollars, which amounts to over 50 million naira in current value.⁹³ With these cost projections, even if requirements were adjusted to suit the Nigeran socioeconomic context, ranching is clearly not affordable to the average cattle owner. Given limited capital, even the large-scale individual cattle owner is not likely to invest in ranches but would hire nomads to herd his cattle. Needless to say, without capital intervention, the nomadic cattle owner is automatically excluded from any conversation around upgrading to ranching.

⁹² "How to Start a Cattle Ranch Business." HowToStartAnLLC.com. October 22, 2020. Accessed May 04, 2021. <https://howtostartanllc.com/business-ideas/cattle-ranch#:~:text=Cattle ranchers>.

⁹³ Holmgren, Lyle, and Dillon Feuz. "2015 Costs and Returns for a 200 Cow, Cow-Calf Operation, Northern Utah." March 2015. Accessed May 04, 2021. https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1716&context=extension_curall.

CHAPTER 11: TAMING THE COWS

For any strategy towards managing Nigeria's farmer-herder crisis to show promise of success, it must possess two critical attributes. First, it must be holistic in perspective, at once taking into consideration each of the cavities in the rabbit hole. Second, in line with the first, it must ensure that every other cavity is plugged while excavating one or more of the ten cavities with a view to preventing the escape of the "rabbit" through any of the others, thus forestalling unintended consequences or policy/strategic slippage. These are critical characteristics of systems thinking.

To assess compliance with this systems approach, three indicators of success in the management of Nigeria's farmer-herder crisis are presented below for each of the ten cavities in the rabbit hole, summing up to a total of 30 indicators. The 30 indicators are presented below under the respective cavities.

30 Indicators of a Holistic Intervention

1. The Career Cavity

- a. Work: Intervention should guarantee occupational expression for the herder as well as the farmer; this means that interventions should provide employment or facilitate entrepreneurship in the respective vocations.
- b. Placement: Intervention measures should facilitate optimal deployment of the respective aptitudes and competences of the farmer and herder.
- c. Productivity: The output of herders as well as of farmers should be boosted by interventions.

2. The Culture Cavity

- a. Identity: Measures should respect the unique cultural identities of the herders, mostly Fulani, as well as those of the respective farming communities.
- b. Community: Relations within ethnic identities must be harnessed; for instance, while enforcing state boundaries, proposed solutions should carefully and

advantageously deploy the tendency towards centrifugal or cross-boundary networks among the Fulanis as well as the centripetal cohesion among host farming communities.

- c. Sustainability: The survival of respective cultures must be guaranteed after the application of policy or strategic measures and after intercultural interactions.

3. The Civilization Cavity

- a. Technology: Interventions should be technology driven, promoting at least one of the features of technology-aided pastoralism including automation, remote impact control, science-aided breeding, barriered farming, and so on.
- b. Engendering: Measures must be gender inclusive.
- c. Property rights: Strategies should respect and protect property rights.

4. The Climate Cavity

- a. Mitigation: Interventions should promote reduction in the rate of global warming and the attendant effects on farming and herding practices.

- b. Adaptation: Strategies and policies should reduce the impact of climate change on the pastoral and arable farming sub-sectors.
- c. Conservation: Measures should promote resource conservation, in particular, land and water resources.

5. The Conflict Cavity

- a. Pre-emption: Interventions should detect conflict hotbeds early enough and prevent escalation.
- b. Peace-making: Measures should include impartial mediatory strategies aimed at ending ongoing or continual violent conflicts.
- c. Peacebuilding: Interventions should include measures aimed at maintaining the peace between herders and host farming communities following successful resolution of conflicts.

6. The Crime Cavity

- a. Prevention: Crime prevention strategies should be embedded in interventions.
- b. Retribution: Adequate punishment should be meted to criminal elements among herders and farmers.

- c. Rehabilitation: Punishment for crime should not be vindictive but aimed at transforming perpetrators.

7. The Conspiracy Cavity

- a. Data: Interventions should be based on verifiable qualitative and/or quantitative data and should further promote data gathering.
- b. Intelligence: Interventions must not compromise classifiable intelligence.
- c. Information: Strategies must include neutralizing conspiracy theories with unembellished evidence-based information dissemination.

8. The Campaign Cavity

- a. Communication: Building on the anti-conspiracy tools of evidential data, creative communication campaigns must be deployed overwhelmingly to subdue politicised messaging around the crisis.
- b. Investigation: Interventions must include investigation of the alleged creators of the crisis by neutral non-partisan agencies.
- c. Conciliation: Interventions should amplify apolitical conciliatory voices.

9. The Competition Cavity

- a. Fairness: Regulation of the arable and pastoral agricultural subsectors must be seen to be fair to the economic interests of stakeholders in both subsectors.
- b. Symbiosis: Strategies should promote “inter- and intraspecies” collaboration - between farmers and herders as well as between largescale and smallholder herders.
- c. Reward: Policy and programme interventions should be designed to reward innovation and productivity.

10. The Capital Cavity

- a. Markets: Strategies should be market-driven, aligning investments with demand.
- b. Inclusion: Strategies should incentivise capital access for smallholder herders or make mergers and acquisitions attractive to small as well as large-holder herders.
- c. Profit: Strategies must ensure profitability; cattle herding must be treated as a business with profit objectives.

The GREEN Chart

These 30 indicators, adequately and holistically applied, can be depicted in the Standard GREEN Chart.

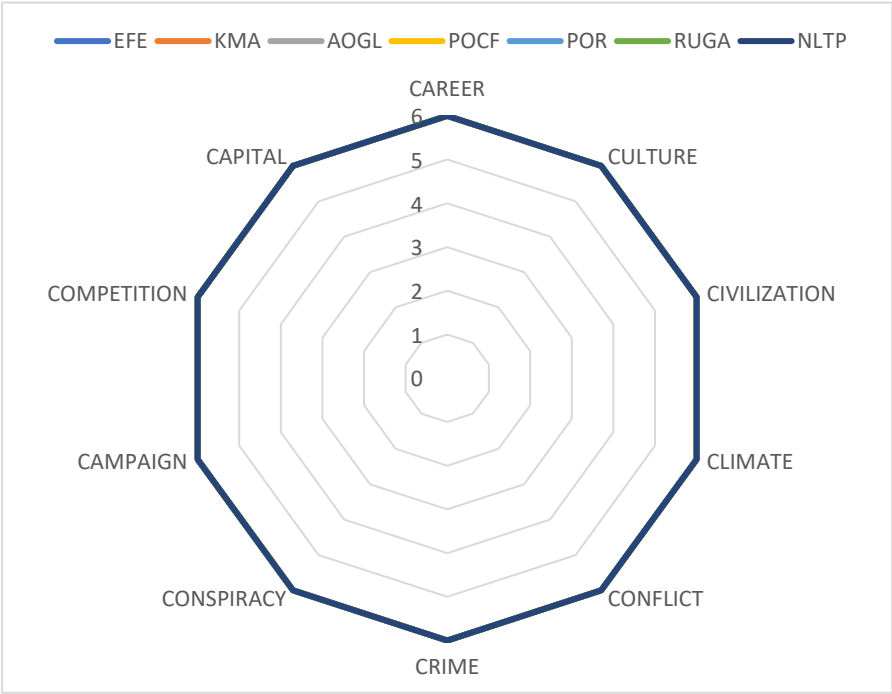


Figure 2: The Standard GREEN Chart



Figure 3: Infographic presentation of the Standard GREEN Chart indicating a systematic and holistic application of intervention indicators.

CHAPTER 15: ASSESSING CURRENT INTERVENTIONS

Most conversations on the farmer-herder crisis readily suggest ranching as an alternative to nomadic herding with legislative and policy proposals presenting varied pathways to ranching. Legislative interventions have largely been at the subnational level of government. Laws against open grazing have been enacted in Taraba, Benue, Edo and Ekiti States.⁹⁴ In June 2018, the Federal Government considered suspending the implementation of anti-grazing laws.⁹⁵ However, earlier in 2021, the Ondo State Government evicted herdsmen from the forests in the state.⁹⁶ Subsequently, in a communique released after a meeting on Tuesday,

⁹⁴ "Nigeria's Anti-Grazing Laws Fail to Address the Root Causes of Rural Conflict." World Politics Review. March 16, 2018. Accessed May 13, 2021. <https://www.worldpoliticsreview.com/trend-lines/24385/nigeria-s-anti-grazing-laws-fail-to-address-the-root-causes-of-rural-conflict>.

⁹⁵ Obalonye, Taiwo. "FG Moves to Suspend Anti-grazing Laws in Benue, Ekiti, Taraba." The Sun Nigeria. June 06, 2018. Accessed May 04, 2021. <https://www.sunnewsonline.com/fg-moves-to-suspend-anti-grazing-laws-in-benue-ekiti-taraba/>.

⁹⁶ Oluwole, Josiah. "Why We Evicted Herdsmen, Cattle from Ondo Forests-Amotekun." Premium Times Nigeria. February 05, 2021. Accessed May 16, 2021. <https://www.premiumtimesng.com/regional/ssouth-west/440846-why-we-evicted-herdsmen-cattle-from-ondo-forests-amotekun.html>.

May 11, 2021, the governors of Nigeria's 17 southern states announced a ban on open grazing in the southern states.⁹⁷

Two years prior, in 2019, the federal government adopted the National Livestock Transformation Plan (NLTP), a 10-year initiative (2019-2028) which seeks to work with willing states to establish ranches.⁹⁸ The NLTP is a N100 billion project that will see the federal government contributing 80 per cent in grant, while participating state governments will contribute "land, project implementation structure, personnel and 20 per cent cost of the project"⁹⁹. Under the scheme, cattle herders are to register as cooperatives with a view to accessing "land rental agreements, grants,

⁹⁷ Sobechi, Leo, Terhemba Daka, Matthew Ogune, Monday Osayande, and Ann Godwin. "17 Southern Governors Ban Open Cattle Grazing." *The Guardian Nigeria News - Nigeria and World News*. May 11, 2021. Accessed May 13, 2021. <https://guardian.ng/news/17-southern-governors-ban-open-cattle-grazing/>.

⁹⁸ Adeshokan, Oluwatosin. "Nigeria Plans to End Herder-farmer Conflicts." *The Africa Report.com*. December 24, 2019. Accessed May 04, 2021. <https://www.theafricareport.com/21548/nigeria-plans-to-end-herder-farmer-conflicts/>.

⁹⁹ "Nigeria to Spend N100 Billion on New Plan for Cattle, Other Animals." *Premium Times Nigeria*. September 19, 2019. Accessed May 04, 2021. <https://www.premiumtimesng.com/agriculture/agric-news/353290-nigeria-to-spend-n100-billion-on-new-plan-for-cattle-other-animals.html>.

loans, and other subsidies from state governments.”¹⁰⁰ In February 2021, the federal government secured a grant of 400,000 Euros (a little over 197 million naira in current value) from Netherlands with a view to commencing the NLTP in four states including Nasarawa, Adamawa, Plateau and Gombe states.¹⁰¹ Meanwhile, the federal government has mapped out 30 grazing reserves across the 19 northern states for the project.¹⁰²

However, despite propositions advanced by proponents to assure Nigerians that the NLTP is a broad-based plan targeted at myriad forms of livestock farming, the NLTP has been rejected by most states in southern Nigeria based on the perception that it is a

¹⁰⁰ Adeshokan, Oluwatosin. "Nigeria Plans to End Herder-farmer Conflicts." The Africa Report.com. December 24, 2019. Accessed May 04, 2021. <https://www.theafricareport.com/21548/nigeria-plans-to-end-herder-farmer-conflicts/>.

¹⁰¹ Nnabuife, Collins. "FG Begins Implementation of €400,000 Livestock Transformation Plan in Four States." Tribune Online. February 23, 2021. Accessed May 04, 2021. <https://tribuneonline.ng.com/fg-begins-implementation-of-e400000-livestock-transformation-plan-in-four-states/>.

¹⁰² Ewepu, Gabriel. "FG Maps out 30 Grazing Reserves for NLTP Project Implementation." Vanguard News. February 25, 2021. Accessed May 04, 2021. <https://www.vanguardngr.com/2021/02/breaking-fg-maps-out-30-grazing-reserves-for-nltp-project-implementation/>.

variant of the Rural Grazing Area (RUGA) ¹⁰³ project perceived by opponents as a Fulani land-grab strategy. A recurrent line of opposition to the scheme has been that it is an attempt to use public funds to finance private business.¹⁰⁴ Meanwhile, some assessment of the plan from a southern sociocultural perspective appear to insinuate that conflict is a pretext to mandate adoption of the NLTP by southern states.¹⁰⁵

Overall, there have been at least seven strategies towards resolving the farmer-herder crisis, some proposed, some active and some suspended. These include:

- i. Evictions and Forced Emigration (EFE)
- ii. Kinetic Military Action (KMA)
- iii. Anti-Open Grazing Laws (AOGL)

¹⁰³ Adeshokan, Oluwatosin. "Nigeria Plans to End Herder-farmer Conflicts." The Africa Report.com. December 24, 2019. Accessed May 04, 2021. <https://www.theafricareport.com/21548/nigeria-plans-to-end-herder-farmer-conflicts/>.

¹⁰⁴ Nasiru, Jemilat. "Makinde: Ranching Is Private Business -- We Won't Provide Land for Free." TheCable. March 03, 2021. Accessed May 04, 2021. <https://www.thecable.ng/makinde-ranching-is-private-business-we-wont-provide-land-for-free>.

¹⁰⁵ Odumakin, Yinka. "Rugbo and Ruga." Tribune Online. September 07, 2019. Accessed May 04, 2021. <https://tribuneonline.ng.com/rugbo-and-ruga/>.

- iv. Privately Owned Cattle Farms (POCF)
- v. Privately Owned Ranches (POR)
- vi. Cattle Settlements: Rural Grazing Areas (RUGA)
- vii. State Owned Ranching: National Livestock Transformation Programme (NLTP)

To map compliance with the standard GREEN Chart, each approach is given a score for each indicator, with 0 as the least possible score and 2 as the maximum possible score. The scoring is based on the potential of each approach to address the crisis when adequately and appropriately applied around each indicator, rather than on actual current, outcomes. For instance, if Kinetic Military Action (KMA) is given a high score card for the Conflict Cavity, it is not a pass mark on the efforts of the military at resolving the conflict; it is simply indicating that, all things being equal, KMA could be harnessed maximally towards addressing the conflict dimensions of the crisis across the three conflict intervention indicators. This is therefore an assessment of policy and strategic potential rather than of results.

Table 1: Indicator Mapping of Current Approaches to Nigeria’s Farmer-Herder Crisis

Note: The coloured cells above the indicators contain the summation of the points scored in the respective cavity by the respective approach.

	EFE	KMA	AOGL	POCF	POR	RUGA	NLTP
CAREER	0	0	6	6	6	6	6
Productivity	0	0	2	2	2	2	2
Placement	0	0	2	2	2	2	2
Work	0	0	2	2	2	2	2
CULTURE	6	0	3	3	3	6	6
Identity	2	0	1	1	1	2	2
Community	2	0	1	1	1	2	2
Sustainability	2	0	1	1	1	2	2
CIVILIZATION	1	2	3	3	4	1	3
Technology	0	0	1	1	2	0	1
Engendering	0	0	0	0	0	0	0
Property	1	2	2	2	2	1	2
CLIMATE	1	0	3	3	3	3	4
Mitigation	0	0	0	0	0	0	0
Adaptation	0	0	1	1	1	1	2
Conservation	1	0	2	2	2	2	2
CONFLICT	2	6	0	0	0	1	6
Premption	2	2	0	0	0	1	2
Peacemaking	0	2	0	0	0	0	2
Peacebuilding	0	2	0	0	0	0	2
CRIME	1	4	1	1	1	2	4
Prevention	0	2	1	1	1	1	2

Retribution	1	2	0	0	0	0	2
Rehabilitation	0	0	0	0	0	1	0
CONSPIRACY	0	6	0	0	0	0	1
Data	0	2	0	0	0	0	0
Intelligence	0	2	0	0	0	0	0
Information	0	2	0	0	0	0	1
CAMPAIGN	0	2	0	0	0	0	0
Communication	0	0	0	0	0	0	0
Investigation	0	2	0	0	0	0	0
Conciliation	0	0	0	0	0	0	0
COMPETITION	0	0	1	2	2	5	4
Fairness	0	0	1	1	1	1	1
Symbiosis	0	0	0	0	0	0	1
Reward	0	0	0	1	1	0	2
CAPITAL	0	0	5	4	4	1	5
Markets	0	0	2	2	2	0	1
Inclusion	0	0	1	0	0	1	2
Profits	0	0	2	2	2	0	2
TOTAL	11	20	24	22	23	20	39
PERCENTAGE	18.33%	33.30%	40%	36.70%	38.30%	33.30%	65.00%

Table 2: Summarized 10-Cavity Scorecard of Current Approaches to Nigeria’s Farmer-Herder Crisis (with 6 as the highest possible score and 0 as the least possible score)

	EFE	KMA	AOGL	POCF	POR	RUGA	NLTP
CAREER	0	0	4	6	6	6	6
CULTURE	6	0	3	3	3	6	6
CIVILIZATION	1	2	3	3	4	1	3
CLIMATE	1	0	3	3	3	3	4
CONFLICT	2	6	0	0	0	1	6
CRIME	1	4	1	1	1	2	4
CONSPIRACY	0	6	0	0	0	0	1
CAMPAIGN	0	2	0	0	0	0	0
COMPETITION	0	0	1	2	2	5	4
CAPITAL	0	0	5	4	4	1	5

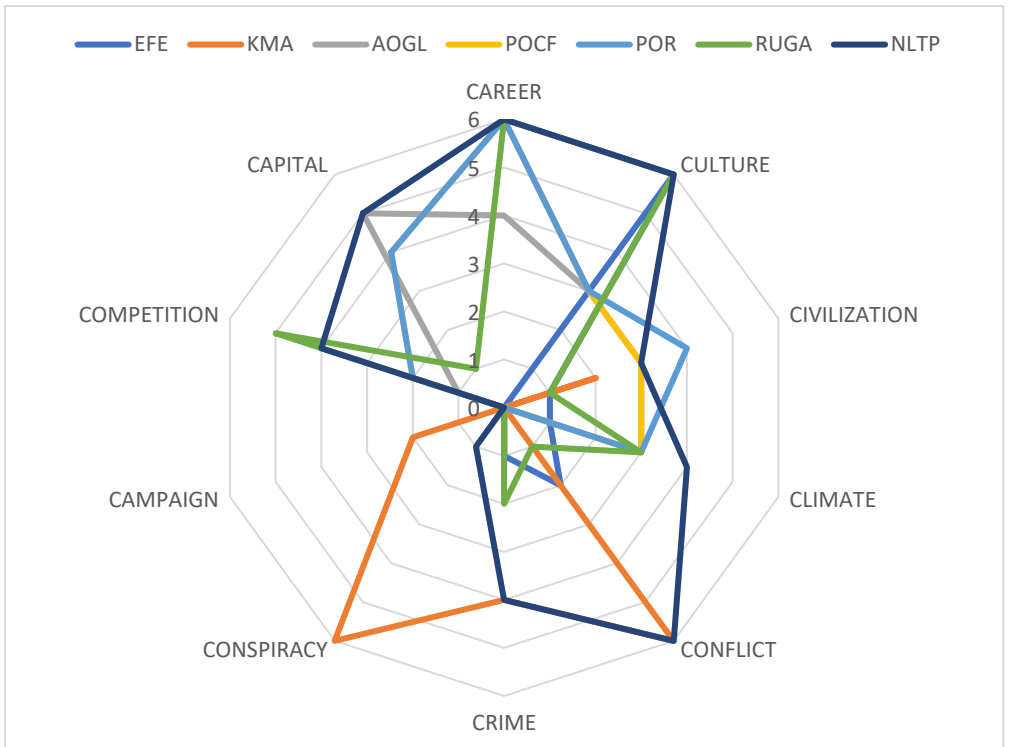


Figure 4: 10-Cavity Scorecard of Current Approaches to Nigeria’s Farmer-Herder Crisis using the GREEN Chart.

A GREEN Analysis of Current Approaches

The chart indicates the prominence of the Career, Culture, and Conflict Cavities in current discourse around the farmer-herder crisis. The prominence of the Culture Cavity reflects the leading role of ethnically motivated voices in advancing approaches to ending the crisis while propositions around the ranching alternative have brought the Career Cavity into focus. Furthermore, the output is reflective of the attention accorded the conflict dimension of the problem as compared to the criminal element. It indicates that perpetrators of violent acts among herders or farmers are currently considered more as actors in conflict situations than as criminals.

While the Capital Cavity is currently brought to the table mostly as part of government-led subsidization interventions, the chart further indicates that current approaches can barely address the Civilization and Climate Cavities. Also worthy of note is the indication that the Campaign Cavity has the least chance of being addressed by current approaches. This is poignant because, for as long as the crisis is politicised unabated, problem solving attempts will be hampered.

Of particular note is the absence of gender inclusive strategies in the current discourse on the farmer-herder crisis. Alongside other elements of the Civilization Cavity, this non-inclusion of gender participation is one of the cultural barriers to civilizational advance in the sector. However, digging into the Civilization Cavity with a view to disrupting it calls for commensurate caution in the Culture Cavity. The sensitivities of the Culture Cavity, if not cautiously managed, could lead to unintended destabilization in connected cavities including the Conspiracy and Campaign Cavities. A disruption of established cultural patterns could provide fodder for conspiracy theorists and political campaigners and could further stimulate tremors in the Conflict and Crime Cavities. Thus, such culture-based intervention measures must incorporate tactical as well as strategic information and communication.

Nevertheless, the major gap in the current approaches is the failure to address the crisis from a holistic systems perspective that, at once, brings into focus the ten cavities in the rabbit hole. The following specific conclusions are deductible from the chart:

1. Evictions and Forced Emigrations (EFE) may preserve cultural identities and conserve forests and may safeguard the property rights of host communities; but they do not optimally deploy the productive competences of farmers and herders. Eviction of pastoralists from farming communities and vice versa only reduces the combined productive potential of both occupational paths. Furthermore, such measures ultimately produce a cycle of crime and conflict.
2. Kinetic Military Action (KMA) has the potential to address conflict as well as prevent and punish crime. In addition, military and policing systems could effectively deal with the conspiracy elements of the farmer-herder crisis; however, the anti-conspiracy objective would require refocussing military and policing action to emphasize data gathering, intelligence mining as well as strategic information dissemination.
3. On the surface, the Anti-Open Grazing Laws (AOGL), if effectively implemented, could boost the productivity of farming and pastoral occupations. However, these laws have tended to ignore the capital access challenge that could

hamper an upgrade to ranching by pastoralists. Generally coming from states with mostly arable farming indigenous populations, these laws have often been aimed at preserving the occupational, cultural and property rights of indigenous farming populations, thus eliciting perceptions of unfairness towards pastoralists.

4. Privately Owned Cattle Farms (POCF) are different from ranches in size and, possibly, in location. They could be small-sized homestead animal farms or feedlots in which cattle are housed and fed. In an early 2021 YouTube video, Nigerian musician, “K1 De Ultimate” was shown modelling the cattle farming alternative to open grazing¹⁰⁶. This model of farming does address the productivity question and shows promise in preventing crime as well as adapting to climate change while conserving resources. However, it throws up the challenge of access to capital. Merely asking pastoral farmers to resort to privately owned cattle farms without facilitating access to factors of production would exacerbate

¹⁰⁶ YouTube. January 30, 2021. Accessed May 04, 2021.
<https://www.youtube.com/watch?v=owYQ0YyjuJE>.

perceptions of unfairness and could oil the wheels of conflict and crime.

5. When opponents of the current system of open grazing and nomadic pastoralism point to ranching as an alternative, they invariably refer to Privately Owned Ranches (POR). A ranch is a sizeable area of land with structures for cattle production and extensive forage for grazing. Setting up and maintaining a ranch is far more capital intensive than cattle farming; hence, Privately Owned Ranches would be the exclusive preserve of cattle-owners with access to substantial capital. Therefore, while this private sector approach shows the highest potential to meet the investment requirement for technology-driven modernization of the cattle industry, it does not deal with the capital access requirement for an inclusive industry and, without social interventions or unique business models, could be insufficient in addressing the culture, conflict and crime elements of the crisis.
6. The Rural Grazing Areas (RUGA) programme was a plan to create cattle colonies or settlements for nomadic pastoralists in every state of the

federation. Although, this could have preserved the cultural assets of nomadic pastoralists, the historical experience of farming communities with such settlements raised concerns regarding the potential of this strategy to disregard property rights, foster crime and intensify conflicts.

7. The National Livestock Transformation Programme (NLTP) is the strategy currently being deployed by the Nigerian government. The table and chart indicate that this programme is the most robust of the various proposals currently on the table. Its core value proposition that sets it ahead of Privately Owned Ranches is its attempt to address the capital access inclusiveness gap through publicly funded ranches which can be accessed by cattle owners under cooperative arrangements. However, this approach, being government funded, may fall short of the investment drive required to foster the adoption and deployment of cutting-edge competitive technologies and, despite the business model, may face challenges of sustainability in the medium to long term.

CHAPTER 16: THE GREEN INTERVENTION MODEL

As earlier stated, GREEN is an acronym for Grassland Real Estate Enterprise Networks. The GREEN Intervention Model deploys the trio of government, business and civil society in a consolidated strategy to transform the cattle industry and end the farmer-herder crisis. The model sees this trio digging into the rabbit hole of the crisis simultaneously with each stakeholder manning respective cavities in the rabbit hole or, in some cases, jointly manning some cavities.

In this triangular stakeholder relations, the government digs into the Conflict and Crime Cavities through targeted policies while facilitating interventions in the other cavities. Meanwhile, big business burrows deep into the Capital and Competition Cavities through massive investment in the cattle industry, forays in the Career Cavity by boosting jobs, enterprise and productivity as an output of investments, and then emerges in the Civilization Cavity, facilitating cutting-edge climate-friendly sector technology adoption while complying with best practices in gender inclusion. On its part, civil society explores the Culture Cavity through creative acculturation, delves into the Climate Cavity by

advocating compliance and then, digs into the Conspiracy and Campaign Cavities with data-driven and evidence-based advocacy.



Figure 4: Venn Diagram of shared responsibilities in the GREEN Intervention Model.

Against this backdrop, GREEN is a plan to modernize the cattle industry by means of private sector-driven investments in modern ranches, the GREEN Ranch.

CHAPTER 17: THE GREEN RANCH

The GREEN Intervention Model emphasizes the role of the private sector, particularly big business and the heavy investor, thus broadening stakeholder participation beyond the cooperative entry port of the NLTP. It sees the flow of capital into the cattle industry through the GREEN Ranch.

The GREEN Ranch is a cattle ranch hosting an extensive acreage of grasslands with nutritious fast-growing forage, allowing year-round grazing. As a piece of real estate, the permanent natural and man-made structures of the GREEN Ranch will be the private property of the investor(s). GREEN ranchers will either be cattle owners herding owned cattle on the ranch or real estate service providers offering cattle owners access to a full range of ranching operations including housing, grazing, husbandry and veterinary services. As an enterprise, the GREEN Ranch will transform cattle herding into a profitable business venture. As a network, GREEN ranches across the country and subregion will engage in knowledge and data sharing, collaborative research, and coordinated ranch-to-ranch cattle migration (in cases of unavoidable forage

access challenge) leveraging appropriate cargo transportation infrastructure.

The following are features of the GREEN Ranch along the lines of six cavities of the farmer-herder crisis requiring private sector-led interventions:

1. The Capital Cavity

A ranch-financing model with any of the following pathways:

- a. Impact Investing: Investment in cattle ranching by the billionaire investor - such investments will follow the trend of the world's billionaires investing in unfamiliar but socially responsible sectors such as agriculture.¹⁰⁷ Billionaires like Bill Gates, John Malone, Ted Turner and Jeff Bezos have purchased hundreds of thousands to millions of acres of farmland for various reasons, from sustainable farming to grazing. The GREEN Ranch offers Nigerian

¹⁰⁷ Shapiro, Ariel. "America's Biggest Owner Of Farmland Is Now Bill Gates." Forbes. January 15, 2021. Accessed May 15, 2021. <https://www.forbes.com/sites/arielshapiro/2021/01/14/americas-biggest-owner-of-farmland-is-now-bill-gates-bezos-turner/?sh=5af40f456096>.

billionaires a profitable platform to deal with a multifaceted social problem.

- b. Backward integration of the cattle industry with investments in cattle ranching by Nigeria's leading dairy or beef industry conglomerates;
- c. Foreign investment in GREEN ranches in partnership with local investors.

2. The Competition Cavity

- a. Offtake agreements between cattle owners and GREEN Ranch investors operating the lease model with a view to making ranch patronage affordable and attractive to the small or average cattle owner.
- b. Acquisition of smallholder herds by cattle-owning GREEN Ranch investors
- c. A stockholding option that will see GREEN ranches buying up cattle from average or smallholder herders and paying such herders in the form of stocks. In other words, current cattle owners will have the option of buying stocks in GREEN ranches using their current cattle herds.

- d. Prospects of lateral integration of GREEN ranches by investors and conglomerates across the country and the subregion, resulting in a network of ranches with economies of scale in cattle production while competition occurs around processing, packaging, and marketing.
- e. Eventual acquisition of NLTP ranches by GREEN Ranch investors with the stockholder option providing an alternative ownership model for NLTP smallholder cooperatives.

3. The Career Cavity

- a. Employment and training of erstwhile nomadic herders by GREEN ranches with absolved herdsmen deployed in modern shepherding, security, administrative and technical support, and so on.
- b. Empowerment of erstwhile nomadic herdsmen as dealers or operators in allied markets such as the beef, milk or hide markets.
- c. Employment of farmers for technology enhanced grass-farming and silvopasture.

- d. Skill-technology interaction monitoring to upskill for technology aided advancements and opportunities to ensure that technology adoption does not result in job losses in the sector.
- e. Staff-housing for absolved nomadic cattle herders and grass farmers.

4. The Civilization Cavity

- a. Systematic deployment of the following technologies:
 - i. grass production facilitated by biotechnology to enable year-round grazing;
 - ii. technology-aided monitoring of grazing patterns with e-shepherding, data analytics and remote sensing technologies deployed to enable precision grazing, prevent overgrazing and facilitate ranch-to-ranch cattle migration where necessary;
 - iii. production automation using such technologies as robotic milking;

- iv. biotechnology-aided breeding in partnership with research institutes to select for desirable traits and boost output;
 - v. mobile herd-management software applications
 - vi. technology-aided perimeter fencing of ranches to prevent or detect breach as added security measures.
- b. Gender inclusion, with female participation at all levels, from the ownership and board of GREEN ranches to ranch management and operations.

5. The Culture Cavity

- a. For cultural appeal, the GREEN Ranch investment strategy could be pioneered by Nigerian billionaires of Fulani extraction or by non-Fulani billionaires in partnership with Fulanis.
- b. Engagement of Fulani traditional leaders as well as MACBAN representatives on the boards of GREEN Ranch companies to facilitate enlightenment and catalyse adoption.

- c. Advertising and communication content in local language and on Hausa/Fulani radio channels to mobilize participation.
- d. As corporate social responsibility, GREEN Ranch sponsorship of creative content including music and film; e.g. the creation and promotion of the legend of the “Nigerian Cowboy” and the “Nigerian Cowgirl” based on the *Pulaaka* code.

6. The Climate Cavity

- a. Powering GREEN ranches through an energy mix that includes bioenergy derived from ranch animal and plant waste (biomass) as well as solar energy.
- b. Adopting technology-guided rotational herding within GREEN ranches and between a network of GREEN ranches.
- c. Adopting tree planting in GREEN ranches to aid carbon sequestration, possibly keying into the Great Green Wall initiative of the African Union.

The potency of this private sector led approach in ending nomadic cattle herding is in the very nature of nomadic herding. The logic is simple: Cows go where the grass is. Locate luscious green grass in guaranteed safe spaces, far away from arable farms and forest reserves, and the force of the invisible hand will herd the cattle in that direction. As cattle products from GREEN ranches are released into the market such that the pastoral agricultural subsector is infused with better breed of cattle, compelled by market forces, nomadic herders will embrace alternatives to primitive transhumance.

Aided by forage technology as well as irrigation systems, the vast expanse of land across northern Nigeria could be harnessed by investors to jumpstart this Sahelian pastoral agricultural transformation. The initial situation of GREEN ranches in northern Nigeria will minimize ethnically motivated obstacles. Other than individual investors and conglomerates pioneering adoption, the GREEN Ranch model may be facilitated by intergovernmental organizations, national and subnational public institutions, and nongovernmental organizations committed to private sector participation and investment promotion.

Finally, it is imperative to state that the GREEN Intervention Model is in pursuance of the Sustainable Development Goals as the model shows immediate promise in achieving the following SDGs:¹⁰⁸

Goal 1: No Poverty

Goal 2: Zero Hunger

Goal 5: Gender Equality

Goal 8: Decent Work and Economic Growth

Goal 9: Industry, Innovation and Infrastructure

Goal 10: Reduced Inequality

Goal 11: Sustainable Cities and Communities

Goal 12: Responsible Consumption and Production

Goal 13: Climate Action

Goal 15: Life on Land

Goal 16: Peace and Justice Strong Institutions

Goal 17: Partnerships to achieve the Goals.

¹⁰⁸ "THE 17 GOALS." United Nations. Accessed May 14, 2021.
<https://sdgs.un.org/goals>.

EPILOGUE

Imagine a Nigeria where a young woman from Igangan in present-day Oyo State can partner with the son of a farmer from Guma in Benue State and the daughter of a once-upon-a-time nomadic Fulani herdsman to build a state-of-the-art cattle ranch spanning thousands of acres of land in Kafin Hausa, in present-day Jigawa state, one of such technology-driven climate-friendly pastoral investment networks across Africa – that is what the GREEN Ranch is all about.

Uzogholo-Ewu, Edo State, the village where my aunt was murdered, is located at an intersection between northern and southern Nigeria. Ewu Junction, well known among drivers who traverse northern and southern Nigeria through Auch/Benin Road, is situated in Uzogholo. Years before my aunt's incident, a group of trailer drivers from northern Nigeria approached an uncle of mine (not the bereaved earlier mentioned) with a request to lease a piece of family land adjacent to Ewu Junction as a trailer parking lot. Despite the financial proposition, my uncle turned down the offer. His concerns were similar to the reasons adduced by opponents of RUGA and NLTP for rejecting these

programmes - the fear of land grab by operators of an ethnically branded activity. Had it been a business proposal presented by a corporate brand such as Dangote Industries Limited, his response may have been different. Had strategies to transform the cattle industry been driven by corporate brands including dairy conglomerates like FrieslandCampina, Dano Milk Nigeria, Nestle Nigeria Plc., and the likes, or by food and animal feed conglomerates like UAC Nigeria, the response would have been market driven.

In his book, *The Wealth of Nations*, Adam Smith introduced the concept of “the invisible hand”, the idea that desirable social outcomes result from the market-driven quest for profit. Although government can facilitate this model through targeted incentives such as tax exemptions for GREEN ranches, the Grassland Real Estate Enterprise Networks (GREEN) takes government out of the driver’s seat of the transformation of the cattle industry and places business and investments in charge. The result will be truly modernized pastoral industries springing from Nigeria and spanning West Africa, leaving trails of jobs, rather than blood.

ABOUT THE AUTHOR

Omoaholo Omoakhalen has over a decade-long experience in public policy development and programme incubation in public governance. Over the years, he has provided policy and strategy solutions to individual and institutional African nation builders, co-designed and facilitated governance capacity building interventions, and developed strategies for governance interventions in Africa. A fellow of the Nigerian Economic Summit Group (NESG) - LEAP Africa Bridge Fellowship Programme, Omoaholo is engaged in the Infrastructure Policy Commission of the NESG as well as the Infrastructure Thematic Working Group of the Federal Government of Nigeria's National Development Plan (2021-2050). He currently serves as Director of Research and Policy Development at the International Centre for Reconstruction and Development (ICRD) and runs a consulting practice at Remake Africa.

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