

SUSTAINABLE UTILISATION OF FORAGE AND GRASSLAND RESOURCES FOR IMPROVED LIVESTOCK PRODUCTION IN NIGERIA

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ABSTRACT

Natural pasture is the most important source of feeds for livestock managed under the pastoral system. There is increasing scarcity and inadequacy of pasture in all parts of Nigeria. Range condition has significantly changed, resulting in decline in the quality and quantity of available grasses. This has negative implications on productivity such as calving interval, milk yield and age at first calving. Despite the efforts by governments in promoting pasture production, its adoption by pastoralists and other stakeholders has been limited by inadequate security over land, low skills, high investment costs and failure of previous attempts. To ensure sustainable availability of pasture, there is the need for increased adoption of participatory range management, promotion of sedentarisation and more effective coordination of farmers and pastoralists relations. Providing capacity building for all stakeholders as well as support for applied research will further enhance the deployment of needed skills and technology for efficient pasture production to meet the needs of the Nigerian livestock industry.

Keywords: Pasture, Rangelands, Pastoralists, Livestock Productivity, Mobility

1.0 Introduction

Forage plants are primarily grasses and legumes, containing more than 18 per cent crude fibre on a dry matter basis (National Academy of Science, 1971). Grasses as fodder are the major feed resource for feeding ruminant animals, particularly cattle, sheep and goats in most countries of sub-Saharan Africa.

Pastoralists are the major socio-economic group involved in the production of ruminant livestock, especially cattle in Nigeria. The pastoralists are widely distributed in the

country, with the largest concentrations in the rural areas of Northern Nigeria. There are also substantial populations in southwestern and southeastern parts of the country. In the recent years, pastoralists have spread to the coastal States of the country. Estimate of pastoralists population widely vary ranging from as low as ten million to as high as over 15 million people.

The most important source of pasture for animals managed under the pastoral system is free range grazing. The free range grazing

involves various forms of movements ranging from daily grazing regimes to long distance migration covering hundreds of kilometers. In regions characterized by marked wet and dry season climatic regimes, livestock mobility is crucial for the sustainable management of the rangelands (WISP, 2008). In Nigeria, this is often in the form of North to South movements, movements from the highlands to the lowlands, and movements from areas of inadequate pasture to areas with better availability of pasture.

Studies have established that the search for feeds, water and safe locations are the dominant factors for the constant migration of pastoralists the world over (Stenning, 1938; Galaty, Aronson and Salzman, 1980; Awogbade, 1983; Lane, 1998, Hesse and Macgregor, 2006; Gefu, 2008). The feeds requirements are mainly in the form of natural grasses, although crops residue and browse trees are also important sources of feeds for livestock managed under the pastoral system of production.

Pastoralists' mobility has been classified using different approaches. The most common are based on the forms and patterns of movement, the distances covered during migrations, and the length of stay of livestock producers at particular locations. Ezeomah (1983) simplified the classification of pastoralists' migration into two, split movements and total movements.

Among the major problems facing pastoralism in Nigeria, as well as other West and Central African countries is acute inadequacy of feeds. The availability and quality of natural grasslands in Nigeria has rapidly decreased. Since the production of alternative feeds either in form of sown pastures or processed agro-industrial feeds is underdeveloped in Nigeria, the adequacy of feeds is significantly impacting livestock productivity and the livelihoods of the pastoralists.

This paper examines the issues and challenges in the utilisation and management of natural grasslands as the dominant source of feeds for ruminant livestock managed by pastoralists in Nigeria. It identified the major limitations constraining pastoralists' investments in pasture production and suggested strategies for attaining an improved and sustainable management of Nigeria's range and grassland resources.

Methodology

Literature review of materials from diverse sources relating to the grasslands utilisation and management in Nigeria was carried out. Internal working documents of relevant institutions and documented records from institutions of governments were used. Empirical data relevant to the subject matter that was collected from the field in the course of other researches was applied, drawing on a number of case studies.

Specifically, research work on pastoralists mobility and access to resources in Northwestern Nigeria in Northwestern Nigeria (Momale, 2015); changing methods of animal husbandry and its effects on cattle rustling (Momale, 2015) where data was collected from Nasarawa, Plateau, Kaduna, Katsina and Zamfara States and FCT Abuja; and an assessment of the problems facing pastoralists in Nigeria (The Pastoral Resolve, 2014) where data was collected from all the geopolitical zones of the country provided the information for this paper. In all of the above mentioned studies, focus group discussions and interviews were held with pastoralists, farmers, traditional leaders and officials of governments in different parts of the country.

Relevance and Challenges of Pastoral Production in Nigeria

Nigeria has the largest population of livestock in West and Central Africa—about 16.6 million cattle; 35.5 million sheep; and 56.5 million

goats. In the 1990's, it amounts to about 26% of the agricultural GDP; and about 10% of the Nation's GDP. Over 90% of the ruminant livestock population are owned and managed by traditional livestock breeders (Maina, 1998) where the main source of feed is natural grasslands. As the savannah zones are the dominant vegetation type in Nigeria (Fig. 1), the pastoralists are widely distributed in nearly all the parts of the country, possibly with exception of the mangrove and fresh water swamps.

Among the major challenges facing pastoralists in Nigeria are inadequacy of grazing lands (and therefore feeds), encroachment on migratory routes, and resting points and conflict with farmers (Baba 1986; Blench, 2004; Okaiyeto et. al, 2008). Others are weak institutional framework for supporting livestock development, near-

collapse of rural governance, cattle rustling, increasing aridity and land degradation in the wake of expanding populations (ALPAN, 1985; Momale, 2015). For example, Nigeria has the rapid expanding population in Africa, tripling over the last half a century from 30.4 million in 1952/53 to 140 million people in 2006.

Again, the Sahel and savannah zones of Nigeria have witnessed significant environmental changes leading to increasing aridity, desertification and range degradation. This has resulted in displacement of pastoralists from the degraded areas, who often move southwards to sub-humid and forests zones of the country. In the sub-humid and forest zones, significant expansion in cultivations had occurred, freezing space for open range needed for growth of natural grasslands.

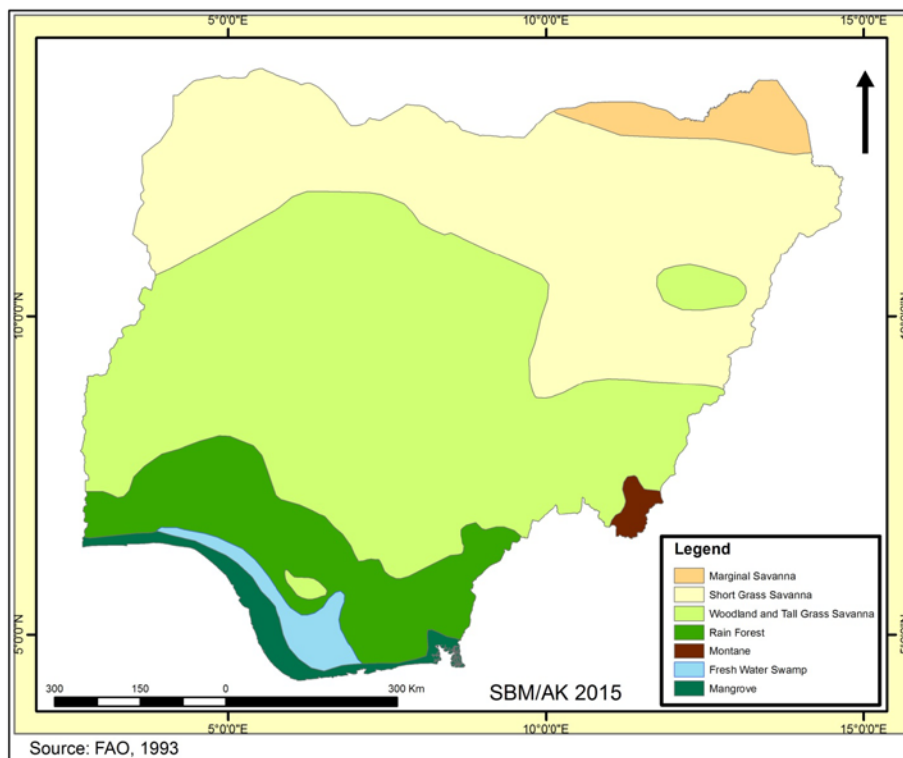


Fig. 1: Vegetation zones in Nigeria

With increasing land pressure, disputes and conflicts between crops cultivators and pastoralists became inevitable. The conflict situation is worsened by ineffective pastoralists – farmers’ conflicts management systems which allow simple disputes like crop damage to degenerate into violent disturbances leading to loss of lives and properties. In recent years, the commercialisation of livestock raiding has gained prominence in many countries including Kenya, Southern Sudan and Somalia, among others. In Nigeria, rustling of cows for commercial reasons is relatively a recent development, particularly on a large scale. The incidences of cattle rustling became prevalent in the last six years and have widely spread,

affecting hundreds of pastoral families in many parts of the country (Schilling, et. al, 2012; Momale, 2015), worsening the state of rural security in many parts of the country. An immediate response by pastoralist communities to high level of cattle rustling is migration from areas highly prone to banditry to those that are less prone (Momale, 2015). In the most affected areas of Nigeria, pastoralists are continuously changing their places of settlement and grazing as presented in Table 2. For those pastoralists that had not migrated, some decided to sell all their animals (common among smallholder cattle and sheep owners) or to create strong vigilante groups that are continuously patrolling the areas to ward-off the bandits.

Table 1a: Areas of recurring conflicts and insecurity (2013 – 2015)

Conflict areas	Dimensions of conflicts	Nature of resistance and displacements
Plateau State: Jos Plateau; Langtang North and South; Wase	Ethno-religious; cattle rustling	Migration of pastoralists to other parts of the States; violent inter-communal conflicts
Nasarawa State: Keana, Obi, Awe; Doma	Pastoralists - farmers; ethnic	Migration of both farmers and pastoralists other parts of the States; violent inter-communal conflicts
Benue: Guma; Logo; Agatu	Pastoralists – farmers	Migration of both farmers and pastoralists; violent inter-communal conflicts
Taraba State: Takum; Wukari; Ibi; Donga	Pastoralists - farmers; ethno-religious	Violent inter-communal conflicts and displacements
Kaduna State: Kaura; Zangon Kataf; Jama'a; Gwantu; Birnin Gwari; Giwa; Chikun; Kagarko	Ethno-religious; cattle rustling	Migration of both farmers and pastoralists; violent inter-communal conflicts. Farmers migrate to other safer nearby communities while pastoralists migrate to other safer areas within the States as well as to adjoining States

Table 1b: Areas of recurring conflicts and insecurity (2013 – 2015)

Conflict areas	Dimensions of conflicts	Nature of resistance and displacements
Borno State: Nearly all rural LGAs	Insurgency	Migration of pastoralists to Niger Republic and Cameroon
Yobe State: Most LGAs in the Northeastern and Southeastern parts	Insurgency	Migration of pastoralists to Niger Republic; and to parts of Jigawa, Bauchi and other adjoining States
Adamawa State: Madagali; Mubi North; Hong; Michika;	Insurgency	Migration of pastoralists to Cameroon, other parts of Adamawa and Gombe States
Zamfara State: Maru, Birnin Magaji; Zurmi	Cattle rustling and rural banditry	Migration of pastoralists to Kwara; Oyo States; and Benin Republic
Katsina State: Dandume; Kankara; Mairua	Cattle rustling and rural banditry	Migration of pastoralists to other parts of Katsina; Kano; Kwara; and Oyo States
Niger State: Rafi; Muya; Shiroro; Mariga;	Cattle rustling and rural banditry	Migration of pastoralists to Kwara; Oyo; Ogun States and Benin Republic

Source: Momale, 2015; Kwaja and Abdul, 2015; Okoli, 2015

IMPLICATIONS OF THE CURRENT SCARCITY OF PASTURE

Search for pasture is among the major reasons for pastoralist mobility. Mobility affects livestock productivity; conflicts; rural insecurity and livelihoods of the pastoral and agricultural populations. The centrality of pasture as a source of feed for pastoral livestock was described by a pastoralists thus: “..... without grasses, there will be no cattle; and without cattle, there will be no herdsmen, which is our heritage” (FGD with pastoralists at Bugai, Birnin Gwari LGA, Kaduna State 2013). Another pastoralist interviewed in 2013 was of the view that: “... I will go to anywhere, in whatever way I can, to get pasture for my

animals” (FGD with pastoralists at Tudun Laabi, Kachia grazing reserve, 2012).

Generally, there is increasing scarcity and inadequacy of pasture in all parts of Nigeria, with the Sahel and savanna zones of the country being the most affected. Range condition has significantly changed over the past decades, and pastoralists readily recognised that (Table 3). Availability of natural grasses which are the dominant source of feed for livestock managed under pastoral systems declined in both quantity and quality with overgrazing, changing climates and expanding cultivations identified as the major drivers (Table 3).

Table 2: Estimate Percentage of Pastoralists Families that Migrated from Areas affected by Armed Banditry and the Receiving Areas of Displaced Families (2012 - 2014)

LGAs	Estimate % of Pastoral Families involved	Receiving areas
Birnin Magaji, Zamfara State	80%	Kwara, Oyo and Ogun States, Benin Republic
Zurmi, Maru, Zamfara State	85%	Niger, Kwara and Oyo States, Benin Republic
Kauran Namoda, Tsafe,	60%	Kebbi, Kwara and Oyo States, Benin Republic

Zamfara State		
Birnin Gwari, Kaduna State	90%	Niger, Kwara, Oyo; Ogun and Kaduna States (around Kachia grazing reserve)
Chikun, Kaduna State	40%	Nasarawa, Kogi, Kwara and Oyo States
Kagarko, Kaduna State	20%	No large scale out-migration, but some to Niger and Kwara States
Kachia, Kaduna State	5%	No large scale out-migration, largely short distance relocations to parts of Zangon Kataf and Jaba LGAs

Source: Momale, 2015

Scarcity of feeds in form of natural grasses has enormous implications on the sustainable pastoralism, security and inter-communal relations, both in the present times, as well as in the forthcoming years. One area of effect is the level of livestock productivity, which further affects the availability and quality of key livestock products like milk and meat (Table 4). Additionally, pastoralists explained that there is an ongoing decline in productivity in all parts of the country, possibly with

exception of few areas in the forest and coastal zones of Nigeria where adequate pasture is found year round.

Although inadequate feeds may not entirely account for the declining levels of livestock productivity, it is certainly among the major factors constraining the productivity of the sector. Inadequate nutrition contributes to preponderance of animal diseases, especially disorders associated with poor nutrition in lactating cows and calves.

Table 3: Pastoralists views on changes in range conditions from the 1980's to the 2010's in some grazing reserves

Grazing Reserve	Range condition before the 1980's	Range condition in the present times (2010's)	Key causes of the changes/other issues
Ruma-Kukar-Jangarai (Runka, Katsina State)	Even at this period, the range was becoming degraded. There were too many livestock	The range is totally degraded. Most pastoralists have migrated away.	Overgrazing; changing climate; encroachment by farmers; insecurity
Gidan Jaja, Zamfara State	The range was fair but the quality was already declining. There was high concentration of livestock	The range is totally degraded. Most pastoralists migrated away. Cattle rustling recently drove away those that were remaining	Overgrazing; changing climate; massive encroachments by farmers; collapse of earth dams; insecurity and cattle rustling
Udubo, Bauchi State	The range was fair, but the quality of pasture was already declining. High concentration of livestock	The range is totally degraded. Pastoralists had migrated away. Farmers have taken over the most of the reserve	Overgrazing; changing climate; encroachments by farmers

Sorau, Taraba State	Very good pasture. Insecurity and tsetse flies were limitations	The area is now overgrazed. Recently, conflicts is affecting its use, but the quality of grasses are now poor	Overgrazing; encroachment by farmers; conflicts with farmers
Kachia, Kaduna State	Grasses were abundant, though its quality was poor. Very few pastoralists	Highly grazed with inadequate pasture of low quality. Many pastoralists are sedentary but animals productivity is very poor	Overgrazing; poor quality grasses
Wase, Plateau State	The range was highly grazed but there was still good pasture. High concentration of pastoralists	The range is degraded. High concentration of pastoralists.	Overgrazing; encroachment by farmers; insecurity
Awe, Nasarawa State	There was good pasture but we did not like the area; It was rarely grazed because there were better grazing areas	The reserve is now overgrazed, though few pastoralists permanently live there. The conflicts in Benue forced some to stay in the reserve	Overgrazing; encroachment by farmers
Bobo, Niger State	The pasture was very good. Few pastoralists	Highly degraded with inadequate grasses. More than half is now cultivated by farmers	Overgrazing, encroachment by farmers
Gidan Magajiya, Kwara State	Very good and adequate pasture. Few pastoralists	Highly overgrazed with many pastoralists. Also many farmers have entered	Overgrazing; encroachments by farmers
Wasinmi, Oyo State	There was good pasture. We were very few then and had so many grazing areas	Farmers have taken over most of the reserve. The remaining areas are overgrazed	Overgrazing; encroachments by farmers

The Pastoral Resolve, 2014; Momale 2014; Momale, 2015

The Table above indicates that the level of productivity of livestock as perceived by the pastoralists is declining all over the country, irrespective of geographic and socio-economic variations. Productivity among pastoral communities are mainly measured by certain

variables such as calving intervals, milk yield per cow and age at first calving. In a related study, pastoralists indicated during FGDs that all these variables are declining when compared to levels in the 1970's as indicated in Table 4.

Table 4: Perceived implications of Inadequate Feeds on Livestock Productivity

LGAs	Community	Calving interval		Milk Yield per Cow (litres)		Age at First Calving	
		1970's	2013-2015	1970's	2013-2015	1970's	2013-2015
Birnin Magaji	Bakin Lamba	1.5	2.5	4.0	0.5	3.0	4.0
	Tungan Buzu	1.0	2.0	3.0	0.5	2.8	4.0
Zurmi	Lugga	1.0	2.0	3.5	0.5	2.5	4.2
	Tsanu	1.0	1.5	4.0	1.0	2.5	4.3
Birnin Gwari	Gayan grazing reserve	1.0	2.0	2.5	1.0	3.0	4.0
	Doka	1.2	2.0	2.5	0.5	3.0	4.5
Chikun	Buruku (Gorso)	1.0	1.8	4.0	0.5	2.7	4.0
	Kasaya	1.0	2.0	5.0	1.0	2.5	4.0
Kagarko	Jere	1.5	2.5	3.0	0.5	3.0	4.0
	Kasiri	1.5	2.0	3.5	0.5	3.2	4.2
Kachia	Kachia grazing reserve	1.5	2.5	3.0	0.5	3.5	4.5
	Awon	1.0	2.0	4.0	1.0	3.0	4.0

Source: Momale, 2015

FACTORS CONSTRAINING PASTORALISTS INVESTMENTS IN FODDER/PASTURE PRODUCTION

Efforts had been made to promote fodder production – especially by Governments encouraging pastoralists to permanently settle, grow fodder and adopt “modern breeding” methods. Pastoralists have so failed to adopt pasture production, drawing interest of researchers to ask the reasons why?

Several factors combine to constrain pastoralists from investing in improved and sustainable pasture production and management. Based on pastoralists’ views, the following factors are dominant:

Non exclusive use of land and pastures – grasses are natural endowments for livestock and all livestock have right to all pastures. Denying animals from feeding or watering in any point is an aberration and against the herders cultural and social code of conduct (*pulaaku among the Fulani*). Land is seen as the free gift of nature and all its resources should be shared among all people.

Inadequate land tenure security and cultural perceptions of land by pastoralists – Land is only valuable for its resources, and there is no need to “exclusively own” land. Herders adopt “opportunistic use of land, when needed resources (pasture and water) are available, the land is used and when the resources become scarce, the land is left for others to use for any purpose. Thus, only very few pastoralists have “homelands” despite the fact they have been part and parcel of the savanna zones of West Africa for centuries. Again, most rural communities are unwilling to sale lands to pastoralists to establish permanent pastures.

Inadequate skills for pasture production – In a focus group discussion with pastoralists, they opined that: “....we have heard and seen how grasses are grown, but it will be difficult for us because we see the Government people making so many measurements that we can’t understand and adopt...” (FGD with

pastoralists at Runka GR, Katsina State, 2013). The weak extension delivery system, coupled with sustained institutional failures in building capacities of livestock breeders and providing functional education ensured that pastoralists continue to depend on indigenous knowledge which is rapidly declining, hence poorer productivity.

High investment costs in setting-up pasture plots – establishing and maintaining pasture plots is expensive especially for smallholder livestock farmers. The high cost of purchasing land (where available) is a disincentive. Again, the long gestation period for cattle implies that they will be fed for many years before any returns are derived. With weak mechanisms for financing investments in agriculture, high interest rates, weak insurance mechanisms and high risks, pastoralists could not access funds to finance investments in pasture development.

Failed initiatives from Government interventions serving as disincentives – In Wase grazing reserve, Plateau State, a pastoralist reported that: “...when they started planting pasture in this reserve (in 1976), my father then told me that grasses cannot be planted in this area, and that only natural grasses can survive and remain. That they (Government) think what is done in Europe will be done here. He told me never to deceive myself and agree with them because one day, all my animals will die of hunger if I depend on them. After five years, all that my father said became true” (a pastoralists in Wase GR, 2013). This view resonates all over, with pastoralists citing examples of collapsed ranches and commercial farms, while their traditional system is still surviving and adapting.

RECOMMENDATIONS ON STRATEGIES FOR DEVELOPMENT AND SUSTAINABLE MANAGEMENT OF FORAGE AND GRASSLANDS

Increased provision and protection of grazing lands – grazing lands are poorly defined in Nigeria – need to establish and protect more communal grazing areas, grazing reserves, stock routes and resting points along the migratory routes, and designate some of the marginal lands as grazing areas. Within these areas, various livestock development initiatives can be pursued through adoption of integrated community development initiatives.

Adoption of integrated and participatory rangelands management – involving all stakeholders to embark on reclamation of degraded rangelands. This should also incorporate effective management of water, soils and vegetation resources.

Promoting sedentarisation of livestock - most pastoralists are today settled, but the livestock are moving. With improved feeds supply and security, the scale of mobility can be reduced and so will be all the other problems especially conflicts and poor productivity of animals.

Improved management and coordination of pastoralists and farmers relations as well as enhancing the effectiveness of rural governance – in many rural communities, governance of pastoralists affairs are in the hands of non-state actors, like association leaders, vigilantes, and self-appointed leaders who mostly work with the Police and occasionally local institutions, most of them with questionable characters. Pastoralists are massively exploited everywhere. Criminal gangs in many areas have taken control and state institutions are either passive or partisan in cattle rustling, armed banditry and massive cheating and extortions. Under these threats,

positive engagement with the pastoralists may be difficult to attain.

Capacity development – with little education and exposure, absence of extension services and any form of training, pastoralists lack capacity for organised and improved management of the range and livestock. Again, indigenous knowledge is rapidly declining.

Development research – not just research, but cutting-edge participatory research that does not extract knowledge from breeders, but build the knowledge of the breeders. Participatory, needs-based, innovative and adaptable research for local, low-income livestock breeders need to be strongly pursued.

Promoting private sector investments in pasture and feeds production – unless this is done where large scale production of affordable feeds are produce and marketed, feeds inadequacy will continue to constrain the pastoral sector. Many pastoralists are willing to purchase feeds, but those feeds are rarely available, often at high prices and low quality. SOGRDEN and ASAN have great roles to play in promoting the production and marketing of feeds as fodder and concentrates. Farmers can only be promoted to produce pasture for sale to livestock producers.

Increased engagement with civil society organisations – not just any civil society, but focused, discipline and professional organisations that will support improved and sustainable development of the Nigeria's livestock industry. Civil society contributes to the development process, and can contribute positively in policy formulation and implementation. However, allowing pastoral associations to dictate and exploit the pastoral communities under any guise must be halted. Professional organisations like SOGRDEN, NVMA and ASAN must wake up to their responsibilities of supporting pastoral development and addressing the various challenges of insecurity and weak governance.

Conclusion

Livestock will continue to require fodder, and mobility will remain part and parcel of pastoralism and will likely remain so for the foreseeable future. Again, pastoralists and farmers will continue to interface in all parts of the country, and will continue to share land resources, thus an effective mechanism for dialogue and consensus building is essential. Thus, understanding the dynamics and issues associated with access to land and management of feeds resources is central to identifying the most viable alternatives available for addressing the challenges of sustainable grasslands management. Until the problem of livestock feeds is addressed, many of the challenges of pastoralism cannot be addressed. The high cost of processed feeds/concentrates is still far away from meeting the needs of traditional livestock breeders.

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