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Forest Reserve Classification: A Strategy for Reducing Environmental Resource Conflicts Arising from Pastoralists' Cultural Semiotics Activities in Forest Reserve Areas of Southeast, Nigeria

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ABSTRACT

Forest reserves in Southeast Nigeria have become theaters of constant violent conflicts, even leading to wars due to the uncoordinated activities of different users, especially pastoralists around the reserves. Not much has been researched on the constant resource conflicts involving forest resource users in the reserved areas, due to the distinct semiotic cultures of the nomads. This study seeks to identify existing forest reserves and their classification, nature, and semiotics of cultural activities and life of the pastoralists causing conflicts, the extent to which pastoral activities cause conflicts, and examine the roles of forest classification in reducing pastoralist conflicts. A total of 150 respondents from reserve areas with conflict occurrences were used to gather information by means of a questionnaire and oral interviews. The data collected were analyzed using percentages and means presented in frequency tables. Results revealed that forest reserves with classifications such as production forest, protection forest, community forest, and watershed forest exist in the five Southeast states. The nature of pastoralist conflicts includes crop-farmer-herder conflicts (98.6%), resource competition (92%), and boundary/land use conflicts (96.6%). The semiotics of cultural activities of the pastoralists causing conflicts include communal and symbiotic land ownership (85.3%), ritualized grazing routes (87.3%), sacred sites as pasture (94%), mobility over fixed ownership (90.6%), among other causes. The heavy presence of the pastoralists resulting in frequent grazing of forest (M=2.70), seasonal migration (M=3.01), frequent use of forest vegetation(M=3.12),water-resource use/pollution (M=2.81), and settlement/encroachment (M=2.53) are pastoralist activities causing conflicts. Forest reserve classification will reduce conflict by clear land-use zoning (M=2.54), establishment of designated grazing land (M=2.81), proper monitoring (M=2.93), and prevention of farmland encroachment (M=2.74), among other measures.

Keywords: *Forest classification, forest reserve, conflicts, semiotics culture, pastoralism.*

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Introduction

Forests are essential natural assets that sustain livelihoods, protect biodiversity, and support ecological stability. In numerous developing countries, forest reserves serve multiple purposes—ranging from conserving species and regulating climate to protecting watersheds and supplying vital resources like timber, firewood, medicinal plants, and pastureland [1]. In Nigeria, forest reserves are legally protected zones overseen by government bodies to ensure the sustainable use and conservation of forest resources [2].

Yet, despite their ecological and economic importance, these areas have increasingly become sites of contention due to competing demands for land and resources. A major source of tension lies in the recurring clashes between pastoralists and farming communities. Pastoralists, who depend heavily on cattle rearing, require consistent access to grazing land and water. Environmental degradation, particularly desertification in northern Nigeria, combined with the expansion of farmland, has driven many herders southward in search of suitable pastures [3].

The southeastern region—comprising Abia, Anambra, Ebonyi, Enugu, and Imo states—is predominantly agricultural, densely populated, and faces acute land scarcity. As a result, forest reserves in this zone are often used informally as grazing grounds by migrating herders. However, unrestricted entry and unclear forest designations frequently spark disputes among herders, farmers, and forest authorities [4]. These confrontations can result in damaged crops, loss of livestock, forced displacement, and sometimes violence, undermining both social harmony and food production.

Forest reserve classification refers to the systematic organization of forest lands according to their designated functions, such as conservation, timber production, community use, or grazing. Proper classification helps define usage rights and manage access, reducing overlap and competition among different user groups [5]. In areas affected by pastoralist-farmer tensions, clearly demarcated grazing zones within or adjacent to forest reserves can help protect agricultural land and conservation areas while accommodating herding needs. Where classification systems are well-designed and enforced, they have proven effective in minimizing land-use conflicts by clarifying responsibilities and expectations. Accurate mapping, zoning, and active management enable authorities to monitor resource use and uphold regulations, promoting sustainability while balancing the interests of farmers, herders, and local communities [6].

In Southeast Nigeria, however, many forest reserves suffer from weak governance, inconsistent enforcement of forestry laws, and poorly defined land-use categories. This lack of structure allows pastoralists to graze livestock freely in forest areas and nearby farms, escalating friction with local farmers. The absence of designated grazing corridors, limited dialogue among stakeholders, and flawed policy implementation further worsen these conflicts [7]. Addressing herder-related disputes in forest zones requires innovative approaches that integrate sustainable forest management with conflict prevention. Establishing clear forest classifications—allocating specific areas for grazing, farming, conservation, and communal use—can reduce friction by ensuring fair access and protecting critical ecosystems. Such a system supports environmental preservation, equitable resource sharing, and rural development. This study therefore, examines forest reserve classification as a means to ease pastoralist conflicts in Southeast Nigeria's forest reserves, exploring how improved land-use planning and forest policies can promote peaceful coexistence among diverse resource users.

Pastoralists' Cultural Semiotics and Land Resource Conflicts in Nigeria

Pastoralism continues to be an essential means of livelihood throughout sub-Saharan Africa, particularly in Nigeria, where it sustains millions of individuals via livestock production, mobility, and trade.

Pastoralists—especially Fulani herders—rely heavily on their access to land and water resources, which face increasing strain due to population growth, agricultural development, climate fluctuations, and evolving land tenure structures. In this framework, the semiotic aspects of pastoralists' cultural practices—comprising symbols, signs, meanings, and modes of communication—play an important role in influencing how land resources are perceived, utilized, and contested [8]. Grasping these semiotic cultural systems is crucial for unraveling the underlying causes of ongoing land resource conflicts between pastoralists and other land users, especially sedentary farming communities. Semiotics, broadly understood as the exploration of signs and symbols and their application or interpretation, presents a valuable analytical perspective for investigating how pastoralists encode meaning into their interactions with the environment [8]. Among pastoral communities in Nigeria, land transcends mere economic value; it is a culturally rich resource infused with symbolic meaning, identity, and heritage. Grazing paths, water sources, and seasonal grazing grounds are often interpreted through inherited knowledge systems, oral histories, and symbolic markers that navigate movement and resource utilization. For instance, particular trees, rivers, or terrains may represent semiotic markers of territorial limits or seasonal grazing routes. These culturally significant signs are passed down through generations and shape pastoralists' spatial actions and ecological choices [9,10].

Yet, these symbolic interpretations of land frequently conflict with the views of settled farmers, whose relationship with land is generally based on ownership, defined borders, and agricultural output. Farmers depend on legal and administrative systems—such as land titles and government regulations—to establish rights to land access and control. In contrast, pastoralists often rely on customary signs and informal arrangements for land use, which can lead to confusion and misinterpretation, particularly in areas where formal governance is weak or inconsistently applied. This difference in how land is symbolically understood plays a major role in fueling resource-related conflicts, as each group holds distinct views on land rights and usage [11]. In Nigeria, clashes between farmers and herders have grown more frequent and severe over recent decades, especially in the Middle Belt and southern regions. While environmental pressures like desertification and climate change are commonly cited as causes—driving herders southward in search of water and pasture—the cultural symbolism embedded in pastoral life also plays a critical, yet often ignored, part [12]. For example, the practice of open grazing among pastoralists is not just a means of survival but reflects a culturally rooted system of movement and shared resource use. When this practice encounters sedentary farming systems that treat land as privately owned and clearly demarcated, friction inevitably follows. The absence of shared understanding around these symbolic systems deepens mistrust, turning disputes into potential outbreaks of violence.

Moreover, pastoralists often communicate through oral traditions, symbolic actions, and unwritten agreements—forms that stand in stark contrast to the formal, document-based systems used by state institutions and farming communities. This mismatch hampers effective dialogue and weakens policy implementation. Government efforts such as establishing grazing reserves or banning open grazing may overlook the cultural significance of mobility for pastoralists, leading to resistance and worsening tensions [9].

In this way, differences in symbolic communication not only contribute to the outbreak of conflict but also obstruct resolution efforts. The influence of symbolic practices also extends to identity and social structure. For pastoralists, livestock represent more than economic value—they signify status, wealth, and social standing. Similarly, for farming communities, land is often linked to ancestral heritage and collective identity. These deep symbolic connections raise the emotional stakes in land disputes, transforming them from simple disagreements over resources into profound conflicts tied to identity. As a result, solutions based solely on economic compensation or legal rulings often fall short, calling instead for a deeper appreciation of cultural meanings and symbolic practices [13].

Given the complexity of these dynamics, there is an increasing need for interdisciplinary research that incorporates cultural semiotics into the analysis of land conflicts in Nigeria. Such approaches could help bridge the divide between pastoralists and farmers by promoting mutual recognition of their differing worldviews and modes of communication. An integrating the symbolic aspects of pastoral culture into land governance, policymakers can develop more inclusive and culturally aware strategies for managing conflict. This might involve creating dialogue forums that value indigenous knowledge, supporting participatory land-use planning, and designing hybrid governance models that blend formal laws with traditional practices. Ultimately, the symbolic practices of pastoral communities are central to understanding the nature of land conflicts in Nigeria. These practices shape how pastoralists perceive, navigate, and communicate about land in ways that often diverge fundamentally from those of other land users. The resulting symbolic disconnect fosters misunderstanding, dispute, and conflict. Addressing these challenges requires not only technical fixes and policy reforms but also a meaningful engagement with the cultural and symbolic dimensions of pastoral life. Placing semiotics at the core of conflict analysis can help scholars and practitioners support more sustainable and peaceful management of natural resources.

Farmer-herder conflicts have become pressing socio-economic and security concerns in Nigeria. In recent years, these tensions have intensified, particularly in regions where competition for land and natural resources is high [14]. In Southeast Nigeria, forest reserves—originally set aside for conservation and biodiversity protection—have increasingly become sites of conflict. Driven by population growth, expanding agriculture, and climate-related pressures, pastoralists are entering these areas to graze their animals. The lack of clear land-use classifications and regulations has led to uncertainty over who has legitimate access to these forest resources. As herders move through forest reserves and adjacent farmlands, crop damage often occurs, sparking disputes with local farmers. These disagreements frequently escalate into violence, resulting in loss of life and property. Beyond immediate harm, such conflicts undermine agricultural production, disrupt rural livelihoods, and weaken community trust [3]. At the same time, weak institutions and poor forest management limit authorities' ability to regulate access effectively. Many forest reserves are inadequately marked or monitored, making it difficult to control grazing or enforce rules. Without clear designations for different zones—whether for conservation, grazing, or resource use—conflicts over land and resources are likely to persist.

Although various government responses have been proposed, many focus on security measures rather than long-term, integrated land-use planning.

As a result, environmental conflicts in forested areas have worsened over time, largely due to overlapping land claims and unchecked exploitation of forest resources. Local communities often depend on forests for their livelihoods, while government agencies aim to conserve ecosystems and uphold environmental regulations. The absence of a clear classification system for forest areas leads to ambiguous access rights, unsustainable use, and rising tensions [15]. This situation threatens both ecological stability and the well-being of rural populations. Therefore, it is crucial to explore how classifying forest reserves according to specific functions could serve as a viable strategy for reducing resource-based disputes. There is an urgent need to assess alternative approaches that emphasize sustainable management and proactive conflict prevention. Classifying forest reserves presents a potential solution by clearly defining permitted activities and responsibilities within different zones. However, there remains limited empirical research on how such classification could help reduce conflicts involving pastoralists in Southeast Nigeria. Consequently, this research aims to address this gap by examining how the classification of forest reserves can aid in decreasing pastoralist conflicts in the forest reserve regions of Southeast Nigeria. The broad objective of this research therefore, is to examine forest reserve classification as a strategy for reducing pastoralist conflicts in forest reserve areas of Southeast Nigeria. The specific Objectives include: a) Identify the existing forest reserves and their classification in Southeast Nigeria; b) examine the nature and causes of pastoralist conflicts in forest reserve areas; c). assess the extent to which pastoralist activities occur within forest reserves; d) determine the effectiveness of forest reserve classification in reducing pastoralist conflicts; e). propose strategies for improving forest reserve classification and management to minimize conflicts.

Methodology

The research took place in Southeast Nigeria, which includes the five states of Abia, Anambra, Ebonyi, Enugu, and Imo. The area is located between latitudes 5°N and 7°N and longitudes 6°E and 8°E. Southeast Nigeria features a tropical rainforest climate that experiences significant rainfall and possesses rich soils ideal for farming. The area has a dense population, and the majority of rural families rely on agriculture as their main means of support. The region contains multiple forest reserves, comprising both community-managed forests and government-operated reserves. Nevertheless, rising population pressure, the expansion of agriculture, and the movement of pastoralists into the area have heightened competition for land and forest resources. This renders the region a significant zone for examining conflicts among pastoralists and the management of forest reserves. The research will utilize a descriptive survey research design. This design is suitable as it enables the researcher to gather information from participants about their views, experiences, and thoughts on conflicts involving pastoralists and the management of forest reserves. Both quantitative and qualitative methods will be employed to gather detailed information from various stakeholders, including farmers, herders, forestry officials, and community leaders. The study utilized both primary and secondary data.

Primary data will be gathered through the following methods: Structured questionnaires given to farmers and pastoralists; Key informant interviews conducted with forestry officials and community leaders; Focus group discussions held with local community members. Secondary data will be gathered from: Government forestry reports; Scholarly journals and textbooks; Publications by international organizations. Information gathered from surveys will be examined through descriptive statistical methods including: frequency distribution; percentages; average scores. The research utilized a multistage sampling method. In Stage 1: Three states were intentionally chosen from the five states in Southeast Nigeria due to the existence of forest reserves and documented pastoralist disputes. In Stage 2: Two communities from forest reserves were chosen from each State, while in Stage 3, individuals were randomly selected from the selected communities, which included farmers, pastoralists, and forestry officials. To ensure adequate representation of the research population, approximately 120 respondents were used as the sample size.

Results and Discussion

Forest Reserves and Classifications in Southeast, Nigeria

Forest reserves in Southeast Nigeria play an essential role in the area's environmental and natural resource management framework. These reserves are legally designated woodlands allocated by government agencies for conservation, research, and the sustainable use of forest resources like timber and non-timber goods. In Nigeria, forest reserves are typically overseen by state forestry departments and were mainly created during the colonial period to safeguard biodiversity and control resource utilization (24,25). In Southeast Nigeria—which includes states like Abia, Anambra, Ebonyi, Enugu, and Imo—forest reserves are mainly found in the tropical rainforest ecological zone, known for its rich biodiversity and thick vegetation. Research shows that there are around 47 forest reserves in the southeastern area, encompassing about 1,335.42 km^2, accounting for about 5% of the region's overall land area. Significant instances consist of the Afi River Forest Reserve in Cross River State (usually regarded as part of the larger southeastern ecological zone), the Ngwo Pine Forest Reserve in Enugu State, alongside various smaller community-managed reserves throughout the area [16]. These reserves play vital ecological roles like carbon sequestration, watershed safeguarding, and habitat preservation for threatened species. Forest reserves in Southeast Nigeria can be generally categorized according to their purpose and management goals. Initially, there are production forests, which are primarily overseen for timber harvesting and various economic reasons within regulated environments. Next are protection forests, established to preserve delicate ecosystems, reduce soil erosion, and sustain water catchments. Third are designated natural reserves or conservation forests, which are well-protected regions established primarily for biodiversity preservation and scientific study, experiencing minimal or no human disruption and ecological succession.

Around here, forest reserves are usually sorted by what they're for and what they do for nature, like this: Timber Production Forests: These are mainly for logging and other money-making stuff, but it's all managed. Think of places like Ngwo Pine Forest where they grow trees for wood and other forest goods; Protection Forests; These are set up to look after delicate environments, stop the soil from washing away, keep water sources safe, and generally keep things stable. Lots of reserves in hilly places, like Udi Hills, are like this; No-Go Nature Reserves: These are super protected spots for keeping wildlife safe and for scientists to study, with hardly any people allowed in. Parts of big reserves, like Afi River, are run with really strict rules to protect nature. Community or Buffer Forests; These are forest areas where people can do some things like farming or gathering forest products that aren't wood, but it's all controlled. They often act as a buffer around the main protected areas [16]

Table 1: Forest Reserves & Classification in Southeast Nigeria

Forest Reserve by States Classification
Abia State
Ndibeagu Forest Reserve Production Forest Reserve
Obeaku Forest Reserve Protection Forest Reserve
Ohambele Forest Reserve Community Forest Reserve
Obieze-Isu Forest Reserve Lowland Rainforest Reserve
Anambra State
Mamu River Forest Reserve Production & Conservation
Anambra Forest Reserve Production Forest Reserve
Osomari Forest Reserve Watershed Protection Forest
Ebonyi State
Afikpo Forest Reserve Protection Forest Reserve
Ukpai Forest Reserve Community Forest Reserve
Ishiagu Forest Reserve Production Forest Reserve
Enugu State
Udi Forest Reserve Protection Forest Reserve
Awgu Forest Reserve Production Forest Reserve
Nsukka Forest Reserve Community Forest Reserve
Imo State
Oguta Forest Reserve Wetland / Watershed Forest
Ohaji Forest Reserve Production Forest Reserve
Okigwe Forest Reserve Protection Forest Reserve

Source: *Ogbodo & Okeke, (2021).*

Nature and Semiotics Cultural Activities Causing Resource Conflict in Forest Reserve Area

Table 2 shows the nature or forms taken by pastoralist conflicts in the study zone. Pastoralists' conflicts in the zone take the following forms: crop-farmer-herder conflict (98.6%), resource competition (92%), boundary and land-use conflicts (96.6%), environmental degradation conflict (86.0%), and violent/security-related conflicts (86.6%). The semiotics cultural activities of the nomads causing conflict are communal and symbolic land ownership (85.3%), ritualized grazing routes (87.3%), sacred sites as pasture (94%), mobility over fixed ownership (90.6%), symbols of territory and control (98.6%), cultural interpretation of resource scarcity (87.3%), water access norms (84.6%), herd size and mobility symbols (86.6%), and migration rituals and social boundary (98.6%). Pastoral conflicts are increasingly significant in many parts of sub-Saharan Africa, especially in Nigeria, where competition over natural resources has intensified. These conflicts typically include pastoralists, mostly nomads and seminomadic herders and other land users such as farmers, forest-dependent communities and government authorities. Generally resource-based, these conflicts are characterised by disputes over access to grazing land, water resources, and forest products. In forest reserves designated legally for conservation and controlled use, the presence of pastoralists often leads to tensions due to perceived encroachment, environmental degradation, and violations of land-use regulations [17]. The causes and consequences of pastoralist conflicts in forest reserve areas are multifaceted and interconnected. In northern regions, climate variability and desertification push pastoralists southward into forest zones in search of pasture and water.

One major factor is environmental change. It increases pressure on already limited resources within forest reserves, often leading to clashes with local communities who depend on these areas for agriculture, hunting, and gathering. Another key reason for this decline is the breakdown of traditional resource management systems. Historically, pastoralists and farmers lived through negotiated access patterns and seasonal migration patterns. Population growth, privatization, and changing socio-political dynamics have weakened these systems, resulting in increased competition and conflict. In forest reserve areas where land ownership and use are strictly regulated, the lack of clear enforcement and overlap between government agencies complicates the situation [14,9].

The symbolic cultural practices of pastoralists signify the array of signs, interpretations, and actions through which these communities engage with their surroundings. Such semiotic frameworks influence the way resources such as land, water, and flora are understood, utilized, and governed. Although these cultural paradigms are vital for maintaining pastoral livelihoods, they frequently lead to disputes over resource use, especially in areas like sub-Saharan Africa, where pastoralists share spaces with sedentary agriculturalists and other land stakeholders. A fundamental aspect of pastoralist symbolism is the communal and adaptable interpretation of land resources [11]. Grazing pastures and water sources are typically regarded as jointly accessible and seasonally available rather than permanently owned or confined. This cultural perspective is deeply entrenched in mobility and transhumance, crucial survival strategies in arid and semi-arid regions. Nonetheless, this viewpoint often conflicts with the sedentary agricultural perspective that prioritizes land ownership, boundaries, and exclusive rights. As pastoralists traverse various territories seeking grazing opportunities, they might intrude upon cultivated areas, resulting in disagreements and, at times, violent confrontations [11].

Livestock hold significant symbolic importance in pastoralist societies, embodying wealth, identity, and social standing. This symbolic significance promotes herd growth as an indicator of achievement and safety. Yet, as herd sizes expand, they often surpass the carrying capacity of existing resources, compelling pastoralists to migrate over broader areas. This heightens competition for limited resources and raises the possibility of confrontations with farmers, conservation bodies, and other land users [18]. Furthermore, pastoralists depend on conventional ecological knowledge systems that are rooted in semiotic signs such as seasonal indicators, vegetation patterns, and the availability of water. These cultural signals steer migration and resource utilization decisions. Nonetheless, environmental shifts, including climate fluctuations and land degradation, have disrupted these traditional cues. Misreading or unpredictability of ecological signs can lead pastoralists into areas that are already overburdened or restricted, intensifying resource competition and conflicts (19, 18). Cultural rituals, norms, and symbolic communication also shape the interactions between pastoralists and other groups. For instance, pastoralists may employ traditional markers or signals to denote grazing rights or territorial claims, but these often go unrecognized by non-pastoralists or formal institutions. Additionally, language differences and unique cultural communication styles can obstruct effective communication with farmers and government officials, resulting in misunderstandings and the escalation of disputes [20].

Ineffective governance frameworks and the sidelining of pastoralist knowledge systems amplify these issues. Official land policies frequently overlook pastoralists' symbolic interpretations of resource utilization, leading to marginalization and restricted access to essential resources. This gap between traditional practices and governmental regulations can provoke tensions, defiance, and strife as pastoralists strive to safeguard their livelihoods [10]. The symbolic cultural practices of pastoralists are vital in influencing resource usage patterns and their engagements with other land users. Although these systems are flexible and tailored to specific contexts, their divergence from sedentary and regulated land-use structures often results in resource use disputes. Solving these disputes necessitates the integration of pastoralists' cultural insights into policy frameworks, fostering intercultural dialogue, and constructing inclusive governance systems that acknowledge varied resource-use practices.

Table 2: Nature/ Cultural Semiotics Activities of Pastoralist Conflicts in Forest Reservesification in Southeast Nigeria

Nature of Pastoralist Conflicts *Frequency Percentage	
Crop farmer—herder conflicts	148 98.6
Resource competition	138 92.0
Boundary and land-use conflicts	145 96.6
Environmental degradation conflicts	129 86.0
Violent/security-related conflicts	130 86.6
Cultural Semiotics Activities of Pastoralists	
Communal symbiotic land ownership	128 85.3
Ritualized grazing routes	131 87.3
Sacred sites as pasture	141 94.0
Mobility over fixed ownership	136 90.6
Symbols of territory and control	148 98.6
Cultural interpretation of resource scarcity	131 87.3
Water access norm	127 84.6
Herd size and mobility symbols	130 86.6
Migration rituals and social boundaries	148 98.6

**Multiple responses*

Extent of Occurrence of Pastoralist Activities

Table 3 shows the frequent activities of the pastoralists in the study area. With a discriminative mean (M) index of 2.50, the following frequent activities occur: grazing in forest reserve (M=2.70), seasonal migration/use of forest (M=3.10), settlement/encroachment in forest (M=2.89), use of forest vegetation as livestock feed (M=3.12), impact on forest reserves (M=2.80), interaction with forest farming communities (M=2.74), water resource use (M=2.81), burning of vegetation (M=2.64), creation of livestock routes (M=2.73), and manure deposition (M=2.84). The activities of pastoralists in forest reserves have become increasingly important, especially in various parts of sub-Saharan Africa, including Nigeria, where competition for land and natural resources is becoming increasingly acute. Forest reserves are designated areas that are legally protected for biodiversity conservation, timber production, and ecological protection. Evidence, however, exists to indicate that pastoralist activities, especially cattle grazing, take place within forest reserves to a significant extent, often in contravention of the law [21]. The level of pastoralist activities within forest reserves differs, although generally, these activities are widespread, especially in areas where land is becoming scarce, desertification is taking place, and agricultural land is being expanded. In Nigeria, for instance, pastoralists, mostly Fulani cattle herders, are increasingly moving into forest reserves as a result of the reduction of grazing land in the northern parts of Nigeria owing to climate change, population, and environmental degradation [22].

The movement is seasonal and, to a certain extent, permanent, resulting in the encroachment into forest reserves, where the pastoralists use the available vegetation and water for cattle sustenance.

From the empirical evidence, the extent and nature of pastoralist activities in forest reserves have been found to vary from temporary grazing to the establishment of semi-permanent settlements. In some forest reserves, intermittent grazing is done during the dry seasons, while in other forest reserves, continuous forest reserves are being occupied because of the failure to effectively enforce forest protection laws [17, 18]. The extent and nature of forest reserve encroachment by pastoralists are also determined by the accessibility and proximity to water sources, as well as the monitoring and enforcement efforts by forest authorities. The increased forest reserve encroachment by pastoralists is partly attributed to the failure of forest management agencies to effectively perform their roles and responsibilities. The forest management agencies are poorly funded and lack the requisite personnel and monitoring infrastructure (23). In some forest reserves, the pastoralists have formed an informal agreement with the local communities, hence the increased forest reserve encroachment. The implications and consequences of forest reserve encroachment by pastoralists are far-reaching. The forest reserve encroachment by pastoralists leads to deforestation, soil compaction, and increased conflicts with local communities

Table 3: Extent of Pastoralist Activities Causing Conflicts

Pastoralists Activities Mean SD
Grazing in forest reserve 2.70 0.59
Seasonal migration/use of forest 3.10 0.74
Settlement/encroachment in forest 2.89 0.64
Use of forest vegetation as livestock feed 3.12 0.78
Impacts on forest reserves 2.80 0.61
Interaction with forest farming communities 2.74 0.91
Water resource use/pollution 2.81 0.81
Burning of vegetation 2.64 0.31
Creation of livestock routes 2.73 0.75
Manure deposition 2.84 0.53

Accepted Mean (M=2.50)

Forest Reserve Classification for Pastoralist Conflict Reduction

Table 4 shows the various ways forest reserve classification can reduce pastoralist conflicts. With a discriminating mean (M) index of 2.50, the following were observed: establishment of designated grazing zone (M=2.81), clear land-use zoning (M=2.54), prevention of farmland encroachment (M=2.74), and proper monitoring/regulation (M=2.93). Other ways include improved resource allocation (M=3.01), protection of sensitive forest ecosystems (M=3.05), promotion of stakeholder participation (M=2.76), support for policy implementation (M=2.87), public awareness and education (M=3.15), and establishment of a conflict resolution mechanism (M=3.07).

Classification of forest reserves, usually involving the categorization of protected forest areas into classes such as strict nature reserves, production forests, game reserves, and community forests, is an essential aspect of forest management. Its contribution to the reduction of pastoralist conflicts, however, is dependent on the effectiveness of the implementation of forest reserve classification. Conflict among pastoralists is usually triggered by competition for land and natural resources, especially between pastoralists and farmers. Forest reserves are also at the heart of pastoralist conflicts due to their ecological value and the availability of grazing resources [17].

One of the significant contributions of forest reserve classification to the reduction of pastoralist conflicts is the creation of land use demarcation. Through effective classification of forest reserves, it is possible to establish boundaries separating forest reserves, agricultural areas, and grazing lands. This is essential in resolving issues of land ownership and usage rights, which are at the heart of pastoralist conflicts.

For example, in the case of strict conservation zones, access is prohibited, while in buffer zones, some form of controlled grazing is allowed under certain conditions [24,25]. If these classifications are adhered to, they are likely to play an important role in the reduction of encroachment and conflicts. However, the applicability of the classification is often undermined by the lack of appropriate mechanisms to ensure compliance. In most developing countries, including Nigeria, the boundaries of forest reserves are not well managed, and as a result, illegal grazing is often allowed in the reserves. This form of poor governance, therefore, undermines the applicability of the classification system, as pastoralists are likely to access the prohibited areas due to the lack of alternative sources [25]. Therefore, conflicts are likely to persist despite the classifications. The other important factor is the involvement of the local communities in the management of the forests. The classification system, especially the top-down approach, tends to be less effective in the sense that local communities, especially pastoralists, are often not involved in the forest management process [6].

When pastoralists are involved in the process, they are likely to respect the boundaries of the reserve and practice sustainability. Socio-economic factors are another challenge to the success of the classification of the forest reserves. Factors such as high population growth rates, climate change, and desertification in the northern region force pastoralists to move further south, which increases the chances of conflict with the sedentary farming population [3]. In these situations, the classification of the forest reserves is not likely to solve the problems unless other solutions are implemented.

Table 4: Forest Reserve Classification Contribution to Pastoral Conflict Reduction

Conflict-reduction Capacity of Forest Reserve Mean SD
Establishment of designated grazing zone 2.81 0.58
Clear land-use zoning 2.54 0.61
Prevention of farmland encroachment 2.74 0.71
Improved resources allocation 3.01 0.68
Proper monitoring / regulation 2.93 0.51
Protection of sensitive forest ecosystems 3.05 0.64
Promotion of stakeholder participation 2.76 0.73
Support for policy implementation 2.87 0.90
Public awareness / education 3.15 0.64
Establishment of conflict resolution mechanism 3.07 0.84

Accepted Mean (M=2.50)

Conclusion

Forest reserves can be found in the five states that make up Southeast Nigeria. These forest reserves have been considered crucial for ecological and socio-economic purposes. Generally, the different categories of forest reserves have been classified for the control and utilization of products within them. These categories include production, protection, watershed, community, and conservation forests. The classification and zoning of forest reserves have been crucial for mitigating and preventing conflicts arising from land use, such as those between farmers and pastoralists.

The pastoralist land conflicts within the forest reserve areas have been attributed to various factors, including conflicts arising from land and natural resources, environmental factors, governance of forest reserve areas, and a lack of classification of land use. These conflicts can be in the form of conflicts between farmers and pastoralists, environmental conflicts, and violent conflicts. The activities of pastoralists within the forest reserve areas have been on the increase in Nigeria, especially due to their migration in search of pasture and water resources. Forest reserve areas, initially considered for biodiversity conservation and timber production, have been utilized for grazing purposes. Therefore, assessing the activities of pastoralists in forest reserves helps in determining how forest resources, agricultural activities, and conflicts are affected by pastoralist migration. Forest reserve classification is one strategy that has been used effectively in reducing pastoralist conflicts in forest reserve areas. This strategy has been effective in regulating land use, providing designated grazing areas, and reducing competition for resources, hence providing a sustainable approach to forest management and the reduction of conflicts associated with pastoralism and farming activities.

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