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A Comparative Analysis of Transhumance, Agro-Pastoralism and Ranching Policies in Southwest Nigeria

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ABSTRACT

Cattle production remains central to food security, employment, and rural livelihoods in Nigeria. Yet the sector is constrained by persistent inefficiencies, conflicts, inadequate infrastructure, and fragmented policy responses. This paper provides a comprehensive policy analysis of transhumance, agro-pastoralism, and ranching cattle production systems in Southwest Nigeria using primary data from 300 cattle-producing households drawn across Oyo, Ekiti and Osun States. Data on farmers' awareness of cattle production policies was used for the study. The study analyses the effects of national policies including the Agricultural Transformation Agenda (ATA), Agricultural Promotion Policy (APP), National Livestock Transformation Plan (NLTP), Rural Grazing Area (RUGA) Settlement Initiative, state anti-grazing laws, and various veterinary and extension policies impacting cattle production. Results reveal extremely low levels of policy awareness among transhumance producers and moderate awareness among agro-pastoralists, while ranchers demonstrate the highest awareness, indicating structural inequities in policy dissemination. The study shows that more than half of cattle producers across all systems were unaware of major livestock policies, with transhumance herders exhibiting the lowest awareness scores. The findings reveal systemic gaps in implementation, weak institutional coordination, cultural misalignment of policies, infrastructural deficits, and absence of inclusive stakeholder frameworks. Emerging policies such as NLTP show potential for structural transformation but face political contestation and poor sensitization. The study concludes that cattle production systems in Southwest Nigeria are shaped by uneven policy impacts, lack of governance coherence, and limited stakeholder participation. A multi-tiered policy reform agenda is proposed, anchored on modernization of production systems, improved extension architecture, strengthened veterinary governance, institutional clarity, peace-building mechanisms, and evidence-driven planning.

Keywords: Open defecation, Public toilets, Techno-economic evaluation, Sanitation technologies, Community-led total sanitation

INTRODUCTION

Cattle production is a major agricultural enterprise in Nigeria, supplying meat, milk, hides, organic manure, and employment for millions. Nigeria hosts the largest cattle population in West Africa, yet local production remains insufficient to meet domestic demand due to low productivity, high mortality rates, resource use conflicts, and climate pressures (Kubkomawa, 2017; Thornton, 2010). The Southwest region dominated by peri-urban cattle markets such as Bodija (Ibadan), Atikankan (Ado-Ekiti), Owode (Osogbo), and Sabo (Akure) depends heavily on Fulani herders and agro-pastoralists for beef supply (Cinjel and Oboromeni 2024). However, the region's cattle systems operate within a complex policy landscape marked by federal-state tensions, inconsistent regulations, and fragmented implementation of livestock reforms. Recent years have seen intensified conflicts between herders and farmers, drought-induced pasture shortages, urban expansion, and rising insecurity, which have prompted multiple policy interventions, from anti-open-grazing laws in Ekiti and Oyo States to national programmes like National Livestock Transformation Plan (NLTP) and Rural Grazing Area (RUGA). Despite these interventions, productivity remains low, partly due to poor policy awareness and misalignment between policy goals and the realities of pastoral systems (Ndiritu, 2025; Rass 2006). Policy responses may therefore account for the coexistence of old and emerging livestock system

Nigeria's cattle industry faces persistent constraints despite multiple policy initiatives. Key challenges include; limited adoption of ranching and semi-intensive production, inefficient veterinary service delivery, weak policy integration and implementation, low policy awareness among producers of cattle, governance fragmentation between federal and state authorities, poor stakeholder engagement, conflicts and climate pressures, weak monitoring and evaluation systems. Policy awareness among cattle producers remains critically low, especially regarding NLTP, RUGA, GES, and CAADP centered programs (Bogale and Erena, 2022; Hristov *et al.*, 2022; Eeswaran, 2022). Over half of producers across systems were unaware of these key livestock interventions, with transhumance producers showing the lowest awareness.

Despite the proliferation of livestock policies in Nigeria including the National Livestock Transformation Plan (NLTP), Agricultural Promotion Policy (APP), RUGA initiative, and state-level anti-open grazing laws evidence from existing literature largely remains fragmented, descriptive, and policy-centric, with limited empirical grounding in how these policies translate into outcomes across different cattle production systems. Most prior studies have focused on isolated issues such as conflict, productivity, or climate vulnerability, often treating cattle producers as a homogeneous group and overlooking the structural heterogeneity between transhumance, agro-pastoral, and ranching systems.

Furthermore, while studies acknowledge policy implementation challenges, there is a critical lack of micro-level empirical analysis linking policy awareness, institutional access, and resource endowments to production system choices and performance outcomes. In particular, the role of policy awareness as a driver of structural transformation in livestock systems remains under explored. Existing research also inadequately addresses how policy impacts differ across production systems, thereby failing to capture the distributional consequences and inequalities embedded in livestock policy frameworks. Another major gap lies in the limited integration of quantitative and institutional analytical approaches. Previous studies rarely combine econometric modelling (such as multinomial logit and MANOVA) with institutional diagnostics (e.g., stakeholder analysis, SWOT, governance assessment) to provide a comprehensive understanding of policy effectiveness. As a result, there is insufficient evidence on whether current policies are inclusive, coherent, and responsive to the socio-cultural realities of pastoralists, particularly transhumance producers who remain the most marginalized. Therefore, the overall aim of this study is to conduct a detailed policy analysis of cattle production systems in Southwest, Nigeria. That is, to identify major policies shaping cattle production in Southwest Nigeria**;** analyze farmers' awareness and perception of these policies, examine how the policies deferentially affect transhumance, agro-pastoral, and ranching systems and identify policy

gaps, inconsistencies, and implementation challenges.

The study offers evidence-based insights for Federal and State policymakers, Agricultural Development Programmes (ADPs), livestock extension systems, conflict resolution agencies, donor and development organizations, pastoral and ranching associations and researchers. The findings contribute to livestock policy discourse and improve the evidence base for sustainable cattle management reforms.

LITERATURE REVIEW

Conceptual Framework

The study is grounded on the relationship between policy environment, production system characteristics, technology adoption, and production outcomes. Policy interventions influence: grazing practices, feed resources, land tenure, disease management, mobility and settlement patterns, crossbreeding and genetics, labour allocation, conflict dynamics

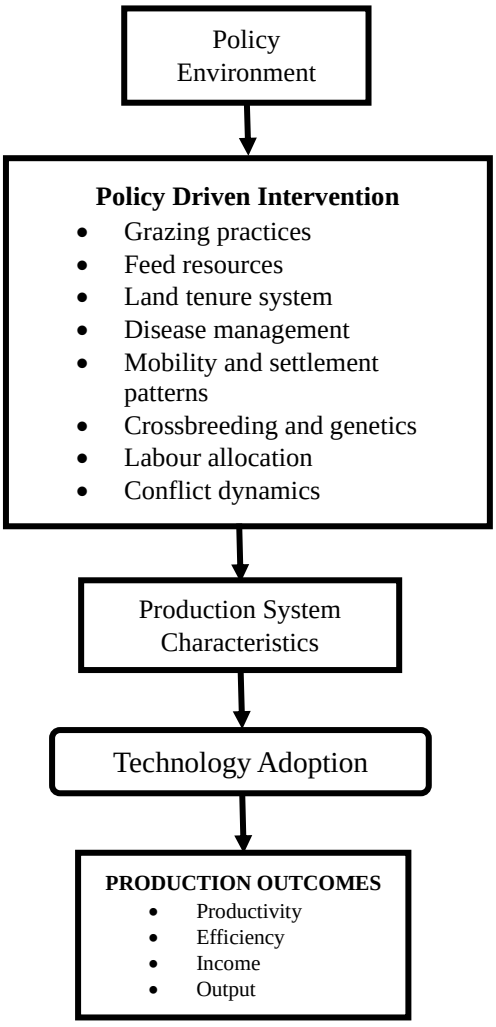


Figure 1: Adapted from Paparamborda (2023)

The framework considers; Input-driven policies (feed subsidies, veterinary reforms); Structural policies (ranching, settlement schemes); Regulatory policies (grazing laws, movement restrictions); Institutional policies (extension governance, livestock research); and Security and land-use policies

Theoretical Framework

Policy Cycle Theory

This theory suggests that policies evolve through problem identification, formulation, adoption, implementation, evaluation, and termination. In Nigeria's livestock sector. many policies reach formulation but fail at implementation. Evaluation mechanisms are weak or entirely absent. Political transitions often disrupt continuity.

Institutional Theory

Cattle production operates within formal and informal institutions. The formal consist of laws, regulations, and policy frameworks while the informal comprises cultural norms, kinship structures, pastoral codes, and local conflict mediation systems. The theory helps explain why pastoralists may resist policies that contradict their norms (e.g., anti-grazing laws).

Governance Theory

Livestock governance in Nigeria is characterized by; multi-layered responsibilities (federal vs. state powers); fragmented coordination; policy capture by political interests and weak enforcement mechanisms. This framework helps interpret inconsistencies in the implementation of NLTP, RUGA, and state-level ranching laws.

Empirical framework

Empirical studies on livestock production in Nigeria and West Africa have increasingly examined the interplay between production systems, policy environments, and productivity outcomes, yet significant gaps remain in linking these dimensions within a unified analytical framework.

Onugu *et al.* (2018) conducted an empirical assessment of cattle fattening enterprises in Mubi, Adamawa State, Nigeria. The study identified security, access to roads, veterinary services, and farmer cooperatives as major factors influencing the profitability of cattle fattening. Insecurity and poor road conditions were found to increase transaction costs, reduce market access, and limit

participation in cattle fattening activities. Bamiro and Shittu (2019) examined the relationship between veterinary service access and livestock productivity in five northern Nigerian states. Employing a fixed-effects model, they found that regular veterinary intervention reduced mortality rates by 18% and increased calving frequency, thereby improving herd profitability. Both studies underscore the critical importance of institutional support systems in progressive manner such that growth of the cattle production industry could be achieved. To address these constraints, the researchers recommended enhanced security measures, improved road infrastructure, and deployment of veterinary personnel to rural areas.

Olafadehan *et al.* (2021) evaluated the seasonal feed shortages and technological responses among 150 smallholder cattle farmers. The authors reported that feed scarcity during the dry season significantly reduced cattle weight gain and milk yield. The study also demonstrated that adoption of improved hay and concentrate technologies led to significant improvements in livestock performance. The results suggested that integrating crop residues, conserved hay, and concentrates is essential to mitigate feed shortages. Ejigah *et al.* (2022) surveyed 210 smallholder cattle producers across Oyo, Kaduna, and Niger States to determine the role of technological innovation and human capital in feed production efficiency. Their findings indicated that training participation, access to innovation centers, and feed processing equipment had positive and significant effects on feed productivity and cost reduction. Farmers involved in technology-based feed production recorded up to 25% higher efficiency compared to non-adopters. The authors concluded that human capital and technology diffusion are crucial to feed system transformation in developing economies.

Kahsay *et al.* (2020) investigated the adoption of improved feed technologies among 360 Ethiopian pastoralists. The study found that level of education, income status, access to credit, and contact with extension officers were significant predictors of technology adoption. Higher education and income levels were associated with increased willingness to invest in feed improvement and cattle fattening Geletu *et al.* (2021) examined the drivers of feed technology adoption among 250 pastoralists and agro pastoralists in Niger State, Nigeria. They identified income, market information, and cooperative membership as key determinants of feed technology uptake. The study concluded that access to markets and financial capital significantly influenced the scale of livestock production.

Adeyemo *et al.* (2023) further analyzed the impact of market infrastructure on cattle profitability among 200 commercial cattle producers in Southwestern Nigeria. The study showed that proximity to feed suppliers, road quality, and storage facilities had strong positive correlations with profitability and feed distribution efficiency. They recommended strategic investment in transport infrastructure to reduce post-harvest feed losses and improve supply chain efficiency. Mwangi *et al.* (2019) conducted an econometric analysis of 150 smallholder dairy farmers in Kenya. The authors reported that feed input costs, access to credit, and market orientation explained over 70% of the variation in milk output. Farms adopting technology-driven feed formulation systems achieved 40% higher productivity than traditional feeders.

RESEARCH METHODOLOGY

Study Area

The policy analysis covers cattle-producing communities in Oyo, Ekiti, and Osun States. These states represent the dominant cattle consumption and supply corridors in Southwest Nigeria. They host diverse production systems from traditional transhumance in Oke-Ogun (Oyo State) to ranching expansions in Osun and Ekiti. Field data confirm the spatial distribution of production systems and ecological constraints described in this research

Data Source

The analysis used both primary and secondary data:

Primary Data

For this study 300 cattle producers were sampled using a multi-stage cluster method to collect data on production systems, socio-economic characteristics, institutional exposure Focus group insights from herders, ranchers, and agro-pastoralists were formed.

Secondary Data

Secondary reports were sourced from policy documents (ATA, APP, NLTP, RUGA, state grazing laws) academic literature, government reports and livestock sector assessments (FAO, AU-IBAR, 2017).

Sampling Procedure

The sample size of 300 respondents was derived using Cochran's (1977) formula, which yielded an initial estimate of 384 at a 95% confidence level and 5% margin of error. However, the final sample was adjusted to 300 to account for the multi-stage cluster sampling design, finite population characteristics, and field constraints associated with pastoral systems. The adopted sample size remains statistically robust, satisfying power requirements for multivariate analyses and ensuring adequate representation across production systems and geographic locations. Therefore, while slightly lower than the theoretical maximum, the sample size is sufficient to produce reliable and generalizable findings within the study area. A four-stage cluster sampling technique (Horpilla & Peltonen, 1992) was used, selecting 3 states → 4 LGAs each → 4 villages per LGA → 5 households per village = 300 respondents

Analytical Techniques

To identify Major Policies Shaping Cattle Production

To identify major policies influencing cattle production systems, a systematic policy review and mapping approach was adopted. Relevant national, regional, and state-level livestock policies—including NLTP, RUGA, APP, ATA, CAADP, and anti-open grazing laws—were compiled from government documents and institutional reports. Content analysis was conducted to extract information on policy objectives and instruments (regulatory, developmental, institutional) and target production systems. Policies were subsequently classified into productivity-enhancing policies conflict mitigation policies market and regulatory policies

To analyze Farmers' Awareness and Perception of Policies

Descriptive Statistics; Frequencies, percentages, and cross-tabulation were used to analyze level of awareness across production systems. A Policy Awareness Index (PAI) was constructed to aggregate awareness scores. Perception Index Construction (PIC); Likert-scale responses were used to generate composite indices for: Policy effectiveness, Accessibility, trust and acceptance Binary/Ordered Logistic Regression: Used to estimate determinants of awareness and perception:

$$\text{Logit}(Yi) = \beta_0 + \beta_1 X_i + \beta_2 S_i + \varepsilon_i$$

Where:

Yi = awareness/perception level

Xi = socio-economic variables

Si = production system

Group Difference Tests

ANOVA test was used to examine differences in awareness across: Transhumance, Agro-pastoral and Ranching systems

To examine Differential Policy Effects Across Production Systems

Multinomial Logistic Regression was used to model the influence of policy exposure on choice of production systems:

$$P(Yi=j) = \frac{e^{\beta j Xi}}{\sum_{k=1}^{J} e^{\beta k Xi}}$$

Multivariate Analysis of Variance (MANOVA) was used to test whether policy impacts (e.g., productivity, mobility constraints, access to services) differ significantly across production systems; to identify policy gaps, inconsistencies, and implementation challenges and compare policy objectives with observed outcomes (e.g., low awareness, weak adoption).

To Identify Missing Policy Instruments and Implementation Failures

SWOT Analysis: Weighted scoring was used to prioritize key Strengths, Weaknesses, Opportunities, and Threats.

Stakeholder Analysis (Power–Interest Matrix). Stakeholders were classified based on; influence (power) interest in policy outcomes and used to explain institutional fragmentation.

Institutional analysis examined roles of government agencies, extension systems. pastoral institutions

Focus on coordination failures and governance gaps. Kendall's Coefficient of Concordance (W) was used to assess agreement among respondents on key constraints. Qualitative Thematic Analysis Interview and field data were analyzed using coding techniques.

RESULTS

Table 1 presents the policy awareness levels among cattle producers, the structure of the cattle policy landscape in Nigeria, and the differential effects of policies on transhumance, agro-pastoral, and ranching systems.

Table 1: Summary of Socio-Economic Characteristics of Cattle Producers (n = 300)

Variable	Category	Frequency	Percentage (%)	Mean
Age (years)	31–40	10	3.33	
	41–50	90	30.00	
	>50	200	66.67	57.38
Gender	Male	300	100.00	
	Female	0	0.00	—
Education Level	Primary	20	6.67	
	Secondary	8	2.67	
	Qur'anic	257	85.66	
	Post-secondary	15	5.00	
Household Size	1–5	80	26.67	
	6–10	9	3.00	
	11–15	95	31.67	
	>15	116	38.67	14.75
Production System	Transhumance	110	36.67	
	Agro-pastoral	130	43.33	
	Ranching	60	20.00	
Herd Size	10–20	10	3.33	
	21–30	78	26.00	
	>30	212	72.67	57.25
Farming Experience (years)	1–5	3	1.00	
	6–10	9	3.00	
	11–15	12	4.00	
	>15	276	92.00	34.27
Breed Type	Local	181	60.33	
	Exotic	35	11.67	
	Crossbreed	84	28.00	

The socio-economic characteristics of cattle producers provide critical insights into the structure, capacity, and sustainability of livestock production systems in Southwest Nigeria.

Age of Respondents

The findings reveal that cattle production is dominated by older individuals, with 66.67% of respondents above 50 years and a mean age of 57.38 years. This suggests that the sector relies heavily on accumulated experience and traditional knowledge, which are essential for managing extensive systems such as transhumance.

However, the low participation of younger individuals raises concerns about succession, innovation, and long-term sustainability. Similar patterns have been reported in pastoral systems where livestock management knowledge is transmitted across generations.

Gender Distribution

The study shows that cattle production is exclusively male-dominated (100%), reflecting strong cultural and socio-economic barriers limiting women's participation. This aligns with traditional pastoral norms where men control

livestock assets and decision-making. While this may ensure role specialization, it also implies underutilization of female labour and managerial potential, which could negatively affect productivity and household welfare. A significant proportion (85.66%) of respondents possess Qur'anic education, while only a small percentage have formal Western education. This indicates a reliance on traditional knowledge systems rather than formal agricultural training. Although Qur'anic education supports basic literacy, the limited exposure to formal education may be a constrain adoption of modern technologies, record keeping and access to institutional support. However, these practices also provide an opportunity for the development of targeted extension programmes that integrate and build upon local knowledge systems, record keeping., access to institutional support. However, it also presents an opportunity for targeted extension programs tailored to local knowledge systems (Warren, 1991)

Household Size

The average household size of 14.75 persons reflects the prevalence of extended family structures and polygamous households. Large households provide abundant family labour, which is advantageous for labour-intensive livestock systems. However, they also increase consumption pressure, requiring higher productivity to maintain household welfare.

Production System

The dominant production system is agro-pastoralism (43.33%), followed by transhumance (36.67%), while ranching (20%) remains less common. This distribution indicates a gradual transition from purely mobile systems to semi-settled systems, although traditional practices still prevail. The relatively low adoption of ranching highlights constraints such as, land access, capital requirements and policy limitations

Herd Size

Most respondents (72.67%) maintain large herds (>30 cattle), with a mean herd size of 57.25 animals. Large herd sizes indicate wealth accumulation, status and potential for economies of scale. However, they also increase vulnerability to disease outbreaks, feed scarcity and farmer–herder conflicts

Farming Experience

An overwhelming majority (92%) of respondents have more than 15 years of experience, with a mean of 34.27 years. This confirms that cattle production is a knowledge-intensive enterprise requiring long-term skill development. Experienced farmers are better equipped to manage risks, but the dominance of older farmers may limit innovation and adoption of modern practices

Breed Composition

The results show that local breeds dominate (60.33%), followed by crossbreeds (28%) and exotic breeds (11.67%). Local breeds are preferred due to their adaptability to harsh environments and disease resistance. However, they are generally less productive than exotic breeds, suggesting a trade-off between resilience and productivity. The presence of crossbreeds indicates a gradual shift toward genetic improvement. The socioeconomic profile suggests that cattle production in Southwest Nigeria is traditional, experience-driven, male-dominated, culturally embedded, characterized by low formal education and large households and gradually transitioning albeit constrained structurally. In identifying major policies shaping cattle production in Southwest Nigeria. The analysis identified a number of dominant livestock-related policies shaping cattle production in Nigeria, including: National Livestock Transformation Plan (NLTP), RUGA Settlement Initiative, Agricultural Promotion Policy (APP), Agricultural Transformation Agenda (ATA), State-level Anti-Open Grazing Laws, Veterinary and Animal Health Policies, and Comprehensive Africa Agriculture Development Programme (CAADP).

Table 2 reveals that Nigeria's livestock policy framework is diverse but fragmented. While developmental policies such as NLTP and ATA aim to modernize the sector, regulatory policies like anti-open grazing laws focus primarily on conflict mitigation.

However, the policy mix is unbalanced, with stronger emphasis on regulation than productivity enhancement. This suggests a shift from development-oriented to control-oriented policy frameworks, limiting transformative outcomes. The findings show that while Nigeria possesses a broad and diverse livestock policy portfolio, their

influence on cattle production systems is uneven and often weak. In analyzing farmers' awareness and perception of these policies, Table 2 shows empirical evidence from awareness data which indicates that only 29.85% of producers are aware of NLTP, 35.31% are aware of RUGA, 21.92% are aware of GES (APP-related) and 17.42% are aware of CAADP.

Table 2: Identified Livestock Policies and Functional Classification

Policy	Type	Functional Role	Target System
NLTP	Developmental	Ranching promotion	Ranching
RUGA	Structural	Settlement development	Agro/Ranching
APP	Institutional	Input support	All
ATA	Developmental	Productivity enhancement	All
CAADP	Regional	Agricultural transformation	All
Anti-Grazing Laws	Regulatory	Conflict control	Transhumance
Veterinary Policies	Institutional	Animal health	All

In contrast, Anti-Open Grazing Laws recorded the highest awareness (49.96%), reflecting their strong enforcement and media visibility. The results suggest that Nigeria's livestock policy environment is policy-rich but impact-poor. Policies such as NLTP and RUGA are structurally well-designed but suffer from low grassroots penetration, weak state-level adoption, and political contestation. Earlier policies such as ATA and APP show limited livestock-sector impact, confirming a historical bias toward crop agriculture. The prominence of anti-grazing laws highlights a shift from developmental to regulatory policy orientation, with greater emphasis on conflict control rather than productivity enhancement.

Table 3: Awareness of Relevant Policies among Cattle Producers

Policy	Transhumance (%)	Agro-pastoralist (%)	Ranchers (%)	Pooled (%)
National Livestock Transformation Plan (NLTP)	19.44	28.46	41.67	29.85
RUGA Settlement Initiative	24.07	33.85	52.00	35.31
Growth Enhancement Support Scheme (GES)	15.74	20.77	30.00	21.92
Comprehensive Africa Agriculture Development Programme (CAADP)	10.19	18.46	26.00	17.42
Anti-Open Grazing Laws (State-Level)	33.33	51.54	69.00	49.96
Veterinary Public Health and Extension Policies	22.22	40.00	58.00	40.07
Livestock Market Regulation Policies	18.52	31.54	44.00	30.69

Policy awareness varies significantly across production systems: Transhumance has the lowest awareness (average =20.5%) among respondents, while agro-pastoralists were moderately aware and ranchers were highly aware (up to 69%). Specifically, Awareness of NLTP ranges from 19.44% (transhumance) to 41.67% (ranchers). Furthermore, awareness of CAADP is extremely low across all groups (10.19%–26%), while veterinary policy awareness ranges from 22.22% and transhumance about 58% among respondents.

Overall, less than one-third of cattle producers are aware of major national livestock policies. The findings reveal a critical awareness gap, which directly constrains policy effectiveness. Low awareness among transhumance producers is driven by high mobility, low literacy levels, weak extension service delivery and cultural distrust of formal institutions. This supports the argument that policy awareness is a prerequisite for adoption, and its absence leads to low compliance, policy resistance and limited behavioural change. Agro-pastoralists benefit from partial settlement, improving access to information, while ranchers' fixed location and institutional integration significantly enhance awareness. The extremely low awareness of CAADP indicates weak domestication of continental policies, limiting their local relevance.

Table 4 shows generally low to moderate perceptions of livestock policies among cattle producers. The highest-rated statement, "Policies reduce farmer–herder conflicts" (Mean = 3.08), indicates that respondents perceive policies primarily as conflict management tools rather than productivity enhancers. Similarly, "Veterinary services are accessible" (Mean = 3.02) reflects relatively positive perception, suggesting some level of effectiveness in animal health interventions. However, most indicators fall below the acceptance threshold (Mean < 3.00). Policy implementation (Mean = 2.50) and policy accessibility (Mean = 2.58) are rated poorly, highlighting serious implementation and dissemination gaps. The lowest-ranked statement, "Policies consider pastoralist needs" (Mean = 2.35), indicates strong dissatisfaction among producers, particularly transhumance herders. These findings suggest that livestock policies are perceived as top-down and insufficiently inclusive and there is limited trust in government interventions. Policies are more effective in conflict control than in improving productivity or livelihoods. Overall, the perception analysis confirms that policy effectiveness is constrained not only by low awareness but also by negative stakeholder perception, which may reduce adoption and compliance.

Table 5 shows that education, extension contact, media access, and production system significantly influence policy awareness among cattle producers. Education (β = 0.135, p < 0.01) significantly increases awareness, implying that literate farmers are more likely to access and understand policy information. Extension contact (β = 0.864, p< 0.01) has the strongest effect, confirming that institutional outreach is critical for policy dissemination.

Table 4: Farmers' Perception of Livestock Policies (Likert Scale Analysis)

Statement	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean Score	Rank
Policies improve cattle productivity	12.00	28.00	18.00	25.00	17.00	2.93	4
Policies are accessible to farmers	8.00	22.00	15.00	30.00	25.00	2.58	6
Government provides adequate support	10.00	24.00	16.00	28.00	22.00	2.72	5
Policies are effectively implemented	6.00	18.00	20.00	32.00	24.00	2.50	7
Extension services are effective	14.00	30.00	12.00	26.00	18.00	2.96	3
Policies consider pastoralist needs	5.00	15.00	18.00	34.00	28.00	2.35	8
Policies reduce farmer–herder conflicts	16.00	34.00	10.00	22.00	18.00	3.08	1
Veterinary services are accessible	15.00	32.00	11.00	24.00	18.00	3.02	2

Table 5: Binary Logit Regression Estimates of Determinants of Policy Awareness

Variables	Coefficient (β)	Std. Error	z-value	p-value	Marginal Effect
Constant	-1.842***	0.412	-4.47	0.000	—
Age (years)	0.021*	0.011	1.91	0.056	0.005
Education (years)	0.135***	0.032	4.22	0.000	0.033
Household Size	0.018	0.014	1.29	0.197	0.004
Farming Experience (years)	0.027**	0.013	2.08	0.037	0.007
Extension Contact (1=yes)	0.864***	0.215	4.02	0.000	0.211
Access to Media (1=yes)	0.593***	0.174	3.41	0.001	0.145
Membership of Association (1=yes)	0.472**	0.198	2.38	0.017	0.116
Agro-pastoral (Dummy)	0.628***	0.201	3.12	0.002	0.153
Ranching (Dummy)	1.214***	0.243	5.00	0.000	0.296

Model Diagnostics

Statistic	Value
Log-Likelihood	-162.45
LR Chi-square	98.72***
Prob > Chi²	0.0000
Pseudo R²	0.233
Number of Observations	300

Access to media (β = 0.593, p< 0.01) enhances awareness, highlighting the role of information channels. Ranching producers (β = 1.214, p< 0.01) are significantly more aware than transhumance producers, reinforcing structural inequalities across production systems. The marginal effects

show that extension contact increases the probability of awareness by 21.1% and ranching increases awareness likelihood by 29.6% Overall, the model is statistically significant (LR χ^2 = 98.72, $p< 0.01$) with a good explanatory power (Pseudo R^2 = 0.233), indicating a strong relationship between socio-economic factors and policy awareness

Table 6 shows a statistically significant difference in policy awareness across production systems (F = 18.67, $p< 0.01$). The between-group variation is substantial relative to within-group variation, indicating that production system type significantly influences awareness levels. Ranching systems exhibit the highest mean awareness (0.487), reflecting stronger institutional integration. Agro-pastoral systems show moderate awareness (0.324), while transhumance systems have the lowest awareness (0.205), confirming their marginalization in policy dissemination.

Table 6: One-Way ANOVA for Differences in Policy Awareness Across Production Systems

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-value	*p*-value
Between Groups	5.842	2	2.921	18.67***	0.000
Within Groups	46.472	297	0.156	—	—
Total	52.314	299	—	—	—
Group Means (Policy Awareness Index by Production System)					
Production System		**Mean PAI**		**Std. Deviation**	
Transhumance		0.205		0.118	
Agro-pastoral		0.324		0.142	
Ranching		0.487		0.165	
Post-Hoc Test (Tukey HSD)					
Comparison	**Mean Difference**	***p*-value**	**Significance**		
Transhumance vs Agro-pastoral	-0.119	0.003	Significant		
Transhumance vs Ranching	-0.282	0.000	Significant		
Agro-pastoral vs Ranching	-0.163	0.001	Significant		

The Tukey HSD post-hoc test indicates that all pairwise differences are statistically significant, confirming meaningful differences across systems. Overall, policy awareness is not uniformly distributed and is shaped by structural factors such as mobility, settlement, and institutional access. This reinforces evidence that livestock policies disproportionately favor settled systems, particularly ranching.

Table 7 shows that policy awareness, institutional access, and resource endowments significantly influence production system choice. Policy Awareness Index (PAI) is the most influential factor. A unit increase in PAI increases the likelihood of agro-pastoralism by 3.6 times and ranching by 8.6 times. This confirms that policy exposure drives structural transformation in livestock systems. Education significantly increases the probability of adopting more intensive systems, indicating that human capital plays a critical role in modernization. Extension contact strongly influences system transition. Producers with extension access are 2.7 times more likely to adopt ranching. Land ownership is a key structural determinant. Ranching requires secure land access, making land tenure a critical constraint for transhumance producers. Access to credit significantly promotes adoption of capital-intensive systems such as ranching. Ranching adoption is more sensitive to policy and institutional variables than agro-pastoralism. Transhumance remains dominant among producers with low awareness, limited institutional access and weak asset base. The effects of livestock policies differ substantially across production systems.

The results from Table 8 indicate a statistically significant multivariate effect of production system on policy-related outcomes. All multivariate test statistics (Wilks' Λ = 0.624, Pillai's Trace = 0.398) are significant at $p< 0.01$, confirming that the combined dependent variables differ across production systems. Policy Awareness significantly differs across systems, reinforcing earlier findings.

Table 7: Multinomial Logistic Regression Estimates for Production System Choice Base Category: Transhumance System

Variables	Agro-pastoral (β)	Std. Err	p-value	Ranching (*β*)	Std. Err	*p*-value
Constant	-0.842**	0.381	0.028	-1.563***	0.442	0.000
Age (years)	0.018	0.010	0.072*	0.025**	0.012	0.034
Education (years)	0.092***	0.028	0.001	0.164***	0.035	0.000
Household Size	-0.011	0.012	0.361	-0.024*	0.014	0.089
Farming Experience	0.021*	0.012	0.078	0.037**	0.015	0.015
Extension Contact (1=yes)	0.556***	0.184	0.002	0.982***	0.221	0.000
Policy Awareness Index (PAI)	1.284***	0.352	0.000	2.147***	0.418	0.000
Access to Credit (1=yes)	0.433**	0.192	0.024	0.865***	0.231	0.000
Land Ownership (1=yes)	0.621***	0.205	0.003	1.304***	0.267	0.000
Statistic			**Value**			
Log-Likelihood			-148.62			
LR Chi-square			124.85***			
Prob > Chi²			0.0000			
Pseudo R²			0.295			
Observations			300			

Relative Risk Ratio (RRR)

Variables	Agro-Pastoral (RRR)	Ranching (RRR)
Education	1.10	1.18
Extension Contact	1.74	2.67
PAI	3.61	8.56
Credit Access	1.54	2.38
Land Ownership	1.86	3.68

Table 8: Multivariate Analysis of Variance (MANOVA) for Policy Impacts Across Production Systems

Test Statistic	Value	F-value	Hypothesis df	Error df	*p*-value
Wilks' Lambda (Λ)	0.624	9.84***	8	588	0.000
Pillai's Trace	0.398	9.62***	8	590	0.000
Hotelling's Trace	0.512	10.03***	8	586	0.000
Roy's Largest Root	0.441	16.25***	4	295	0.000

Dependent Variables Included *(Policy Awareness Index (PAI), Productivity Score, Access to Veterinary Services, Mobility Constraint Index)*

Follow-up Univariate ANOVA Results

Dependent Variable	F-value	*p*-value	Significance
Policy Awareness Index	18.67***	0.000	Significant
Productivity Score	12.45***	0.000	Significant
Veterinary Access	9.28***	0.000	Significant
Mobility Constraint	21.14***	0.000	Significant

Variable	Transhumance	Agro-pastoral	Ranching
Policy Awareness	0.205	0.324	0.487
Productivity Score	2.41	3.12	3.85
Veterinary Access	2.18	2.96	3.67
Mobility Constraint	4.12	3.05	2.11

Productivity scores are highest among ranchers, indicating stronger benefits from livestock policies. Veterinary access improves progressively from transhumance to ranching systems. Mobility constraints are highest among transhumance producers, reflecting the restrictive impact of grazing policies. The results confirm that livestock policies have differential and system-specific impacts, with ranching systems benefiting the most and transhumance systems experiencing constraints and limited support. The MANOVA analysis provides strong evidence that livestock policies influence multiple outcome dimensions simultaneously. Policy impacts are not uniform, but vary significantly across production systems This reinforces the argument that current policy frameworks contribute to structural inequality in livestock production, favoring sedentary systems over mobile pastoralism.

To Identify Policy Gaps, Inconsistencies, and Implementation Challenges

SWOT Analysis of Nigeria's Livestock Policy Environment. A SWOT analysis reveals systemic advantages, weaknesses, opportunities, and risks associated with the current policy environment.

Strengths

a. Rich policy portfolio (NLTP, APP, CAADP, veterinary reforms)
b. High political attention due to national security concerns
c. Federal funding commitments for modernizing the sector
d. Growing private-sector interest in ranching
e. Large cattle market demand in the Southwest

Weaknesses

a. Low policy awareness, especially among transhumance herders
b. Fragmented governance, unclear federal–state roles
c. Weak extension infrastructure
d. Land tenure complications for ranching
e. Poor veterinary and feed service delivery
f. High mobility limits programme access
g. Policy inconsistency between administrations

Opportunities

a. Growing shift toward ranching and semi-intensive systems
b. Youth interest in agri-business
c. Availability of abandoned government lands for ranches
d. Regional cooperation opportunities (ECOWAS transhumance protocol reform)
e. Technology-driven solutions (GPS tracking, digital veterinary services)
f. International donor interest in sustainable pastoralism

Threats

a. Farmer–herder conflict escalation
b. Political mistrust between regions
c. Climate change impacts on forage availability
d. Insecurity along grazing routes
e. Ethnic tensions exacerbated by policy narratives
f. Market volatility and feed price shocks

The study identified several critical policy gaps and constraints:

Low Policy Awareness

Less than one-third of producers aware of key policies

Implementation Failures

NLTP and RUGA characterized by Poor funding, Political resistance and Weak community engagement

Institutional Fragmentation

Multiple agencies with overlapping mandates weak coordination across governance levels

Cultural Misalignment

Ranching policies conflict with pastoralist norms and resistance to sedentary production systems

Weak Extension Services

Limited outreach to transhumant herders and poor dissemination of veterinary policies

Land Tenure Constraints

Conflicts over land access for ranching

Security Challenges

Insecurity limits policy implementation and service delivery. These findings highlight a systemic governance failure in livestock policy implementation.

Table 9: Stakeholder Roles and Influence in Policy Implementation

Stakeholder	Role	Influence	Policy Implications
Federal Government	Designs national policies (NLTP, RUGA, APP)	High	Implementation often stalled by state resistance
State Governments	Enact grazing laws; allocate land for ranching	High	Policies may conflict with federal directives
Local Governments	Regulate markets, issue permits	Medium	Limited resources for enforcement
ADPs/Extension Services	Disseminate policies, provide training	Medium-Low	Weak outreach to mobile pastoralists
Pastoralist Associations (MACBAN)	Advocate for pastoralist rights	High among herders	Often excludes ranchers and agro-pastoralists
Ranchers' Associations	Promote intensive production systems	Medium	Push for ranching incentives
Traditional Rulers	Control land, mediate conflicts	Medium-High	Key gatekeepers in rural areas
Security Agencies	Enforce anti-grazing laws	High	Actions often escalate tensions
NGOs (Peacebuilding, Livestock Dev.)	Capacity building, conflict mediation	Medium	Improve communication but limited coverage

The major issue is not policy absence, but a disconnect between policy design and field realities. Key structural problems include: Poor policy communication strategies, lack of stakeholder inclusion, weak institutional coordination. The interaction between formal policies and informal pastoral institutions further complicates implementation, leading to non-compliance, conflict escalation and policy rejection. Overall, the policy environment is characterized by low coherence (federal vs state policies) low inclusiveness (exclusion of transhumance systems) and low effectiveness (limited impact on productivity and welfare).

Table 10 shows the Kendall's coefficient of concordance for ranking constraints. The coefficient (W = 0.62) indicates a strong and statistically significant level of agreement among cattle producers regarding the major constraints affecting livestock policy effectiveness.

Table 10: Kendall's Coefficient of Concordance (W) for Ranking Policy Constraints

Constraint	Mean Rank	Rank Position
Low Policy Awareness	6.82	1st
Weak Policy Implementation	6.35	2nd
Institutional Fragmentation	5.91	3rd
Cultural Misalignment	5.42	4th
Weak Extension Services	4.98	5th
Land Tenure Constraints	4.36	6th
Security Challenges	4.16	7th

Summary Statistics for Kendall's W

Statistic	Value
Number of Respondents (n)	300
Number of Constraints (k)	7
Kendall's Coefficient (W)	0.62
Chi-square (χ^2)	1116.24***
Degrees of Freedom (df = k−1)	6
p-value	0.000

Decision Rule: W=0 → No agreement; W=1 → Perfect agreement

The associated Chi-square value (χ^2 = 1116.24, p< 0.01) confirms that the agreement is not due to chance, validating the consistency of respondents' rankings. Low policy awareness is ranked as the most critical constraint, reinforcing earlier findings from the awareness analysis. Weak implementation and institutional fragmentation follow closely, highlighting systemic governance failures. Cultural misalignment ranks fourth, indicating that policies are not adequately adapted to pastoral realities. Security challenges, although important, rank lowest, suggesting that producers perceive institutional weaknesses as more binding constraints than external threats.

The high level of agreement suggests that the identified constraints are widely experienced across production systems. There is a shared perception of systemic policy failure. This strengthens the validity of the study's conclusion that the primary issue in Nigeria's livestock sector is not policy absence, but poor implementation, weak coordination, and limited inclusiveness.

CONCLUSION

This study analyzed the policy environment governing cattle production systems in Southwest Nigeria using data obtained from 300 cattle producers and a comprehensive examination of national and state-level policies. The analysis explored how federal initiatives (NLTP, RUGA, APP, ATA), international frameworks (CAADP), veterinary public health policies, and state-level anti-open grazing laws influence the three dominant production systems: transhumance, agro-pastoralism, and ranching. such as NLTP (19.44%), RUGA (24.07%), and CAADP (10.19%) compared to higher levels of awareness among ranchers (41–69%). This directly affects policy adoption and shapes the differential impacts of livestock policies across production systems. The study further revealed that Nigeria's livestock policy landscape suffers from institutional fragmentation, weak implementation capacity, poor extension delivery, and cultural misalignment between policy design and pastoralist realities. Policies aimed at modernization, particularly ranching, often overlook socio-cultural, economic, and ecological dimensions of pastoral livelihoods. As a result, interventions such as the National Livestock Transformation Plan (NLTP) and RUGA fail to translate effectively into practice.

The analysis indicates a clear hierarchy of policy beneficiaries. Ranchers benefit the most, owing to higher policy awareness, fixed settlement patterns, and stronger institutional linkages. Agro-pastoralists experience moderate benefits but are constrained by mixed production demands and limited capital. Transhumance producers remain marginalized, facing the greatest challenges under restrictive policies such as anti-open grazing laws and enduring the least support from policy schemes designed to modernize the sector. The overarching conclusion is that policy design in Nigeria has not adequately integrated the socio-economic diversity of cattle production systems, nor has it effectively harmonized federal and state-level objectives. Sustainable transformation of the livestock sector requires a more inclusive, coordinated, and evidence-based policy framework that balances modernization with pastoralist realities, incorporates conflict prevention mechanisms, and enhances institutional capacity at all levels.

POLICY RECOMMENDATIONS

Based on the evidence generated and the policy gaps identified, the following recommendations are proposed to improve the effectiveness and inclusiveness of livestock policies in Southwest Nigeria.

Strengthen Policy Awareness and Sensitization
This may include

i. Deploying mobile extension services targeted specifically at transhumance corridors.

ii. Improving policy awareness is essential for adoption of reforms such as NLTP, GES, and veterinary regulations.

Reform Extension and Veterinary Service Delivery

i. Strengthen Agricultural Development Programmes (ADPs) through increased funding, and mobility resources.

ii. Establish Mobile Veterinary Units for remote pastoral settlements. Train and deploy Community Animal Health Workers (CAHWs) to serve as intermediaries between formal veterinarians and pastoralists.

iii. Develop digital veterinary advisory platforms for real-time livestock disease reporting.

Enhanced service delivery will reduce disease burdens, improve productivity, and support compliance with animal health policies.

Harmonize Federal and State Policies
Federal policies (e.g., NLTP) frequently clash with state-level grazing laws and land-use regulations. To address this:

i. Establish a National–State Livestock Coordination Council to harmonize policy objectives, land-use guidelines, and implementation strategies.

ii. Create joint federal-state livestock development budgets to support ranching and feed development projects.

iii. Standardize livestock movement regulations across Southwest states to prevent policy-induced conflict or confusion.

Greater coherence will enhance stability and reduce political tensions that undermine implementation.

Facilitate Inclusive and Sustainable Ranching Systems

Ranching policies must be designed to include not only wealthy ranch operators but also smallholder pastoralists and agro-pastoralists. Suggested actions include

i. Subsidizing pasture establishment, fencing, and water infrastructure for small-to-medium ranch units.

ii. Providing low-interest livestock loans through microfinance institutions and cooperative societies.

iii. Developing cooperative or community-owned ranch models accessible to pastoralists transitioning from transhumance.

iv. Ensuring transparent and culturally sensitive land acquisition protocols in collaboration with traditional rulers.

This prevents ranching from becoming an elite-driven model and supports equitable access.

Invest in Feed and Pasture Development

Feed scarcity is a major cause of low productivity. Policies should

i. Encourage states to allocate land for public and private pasture development.

ii. Support fodder banks, dry-season feed reserves, and silage-making initiatives.

iii. Promote cultivation of climate-resilient forage varieties (e.g., Brachiaria, Panicum).

iv. Incentivize private sector investment in commercial feed production.

Strengthening feed systems will reduce reliance on open grazing and enhance productivity across all livestock systems

Incorporate Climate-Smart and Conflict-Sensitive Approaches

Policies must integrate environmental and security dimensions such as:

i. Developing climate-resilient grazing reserves equipped with boreholes and controlled grazing infrastructure.

ii. Strengthening community-based peacebuilding mechanisms involving farmers and herders.

iii. Incorporating conflict impact assessments into all cattle-related policies.

iv. Promoting alternative livelihood programs for youth involved in cattle rustling or farm vandalism.

A climate- and conflict-sensitive policy approach is vital for long-term stability.

Strengthen Monitoring, Evaluation, and Research–Policy Linkages

Institutionalize annual livestock policy reviews at the state and federal levels. This may include the following actions:

i. Integrating livestock data systems (disease surveillance, herd registration, conflict reporting).

ii. Supporting collaborative research between universities, NAPRI, ADPs, and NGOs. Use evidence-based frameworks (e.g., cost-benefit analysis, social impact assessment) to guide policy reform.

Effective M&E will enhance implementation and ensure policy continuity across administrations.

Promote Inclusive Stakeholder Engagement

Involve pastoralists, agro-pastoralists, ranchers, traditional rulers, farmers' associations, and security agencies in policy formulation. Tools for this may include;

i. Participatory policy design tools such as multi-stakeholder platforms (MSPs) and stakeholder dialogues.

ii. Building trust-based relationships between pastoralists and state governments through continuous engagement.

Policies are only effective when stakeholders perceive them as legitimate, fair, and culturally respectful.

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