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PROJECT PLANNING STRATEGIES FOR SUSTAINABLE AGRO-PASTORAL ENTREPRENEURS IN RURAL COMMUNITIES: A CASE STUDY OF BALIKUMBAT SUB-DIVISION, CAMEROON

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ABSTRACT

Agro-pastoral enterprises play a vital role in sustaining rural livelihoods in Cameroon, particularly in regions like Ngoketunjia Division where agriculture and livestock are the backbone of the economy. However, these enterprises face numerous challenges, including limited access to formal planning tools, training, and institutional support. Most agro-pastoralists rely on informal planning strategies, which constrain productivity, resilience, and long-term sustainability. This study examines the project planning strategies employed by agro-pastoralists in Balikumbat Subdivision and assesses their effectiveness in promoting enterprise sustainability. A mixed-methods approach was used, involving structured questionnaires administered employed, involving the administration of structured questionnaires to 150 agro-pastoralists across five villages, complemented by focus group discussions and key informant interviews. Quantitative data were analyzed using SPSS version 22.0, employing descriptive statistics to explore planning patterns and socioeconomic characteristics. Qualitative data were thematically analyzed to capture indigenous practices and contextual challenges. The findings reveal that only 35% of respondents utilized formal planning tools, with key challenges including limited training (62%), resource constraints (58%), and climate variability (47%). Despite these constraints, traditional strategies such as crop diversification and rotational grazing continue to enhance resilience. The study recommends integrating indigenous knowledge with modern planning tools and strengthening institutional support to foster sustainable rural agro-pastoral development.

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INTRODUCTION

Agro-pastoralism, the integrated practice of crop cultivation and livestock rearing, remains a cornerstone of rural livelihoods in Sub-Saharan Africa, particularly in Cameroon, where agriculture employs nearly 70% of the labor force (FAO, 2020). This dual livelihood strategy is crucial in addressing food security, diversifying income sources, and mitigating vulnerability to external shocks (Dossa et al., 2011; Tchawa, 2017). In the Balikumbat

Sub-Division of Ngoketunjia Division in the Northwest Region of Cameroon, agro-pastoralism supports approximately 75% of rural households (MINADER, 2021). The community heavily relies on seasonal crop farming, notably maize, beans, and groundnuts, as well as livestock, including cattle, goats, and poultry, forming a socio-economic base for local development and traditional systems of exchange (Nchinda et al., 2013). Despite its importance, the sustainability of agro-

pastoral systems is increasingly threatened by interconnected challenges, including climate variability, declining soil fertility, overgrazing, and inadequate infrastructure (Kongnso et al., 2021). Climate variability, marked by erratic rainfall, prolonged dry spells, and an increased frequency of extreme weather events, has disrupted planting calendars and water availability, severely affecting yields and livestock health (Kongnso et al., 2021; Molua and Lambi, 2007). These changes have had a profound impact on Mbororo pastoralist communities in the Kilum-Ijim region, where traditional grazing patterns are breaking down due to ecological stress (Kongnso, 2024).

In addition, resource constraints continue to limit the resilience and productivity of agro-pastoral enterprises. Studies have shown that smallholder farmers often lack access to capital, quality inputs, modern equipment, and productive land, thereby hindering the adoption of climate-smart and sustainable practices (World Bank, 2023; Tening et al., 2021). Rural infrastructures, such as feeder roads, irrigation schemes, and veterinary services, are either underdeveloped or poorly maintained, further exacerbating the vulnerability of these communities (Nkem et al., 2019). Women, who are active participants in farming and animal rearing, face gender-specific barriers, including limited land rights and exclusion from decision-making processes, which makes them more vulnerable to shocks (IFAD, 2022).

In response to these mounting challenges, there is growing recognition of the need to integrate indigenous knowledge systems with formal project planning strategies to enhance sustainability and resilience. Integrating Indigenous Knowledge Systems (IKS) into formal planning has improved sustainability in parts of Africa. Kenya, South Africa, and Ghana offer successful examples in land use, climate adaptation, and conservation (Manyaga et al., 2024). Cameroon can adopt similar models to enhance inclusive planning. Traditional coping mechanisms such as crop diversification, transhumance, rotational grazing, and seasonal weather forecasting have long helped communities manage risks (Azibo et al., 2016; Nyong et al., 2007). However, these practices often lack formal institutional backing and are not integrated into broader development planning frameworks. Research suggests that combining bottom-up, locally driven innovations with top-down approaches, such as participatory rural appraisal (PRA) and results-based management (RBM), can yield more inclusive and

adaptable project planning outcomes (Chambers, 1994; Kimengsi and Buchenrieder, 2015).

Given these complexities, this research aims to explore and document project planning strategies that can strengthen sustainable agro-pastoral entrepreneurship in Balikumbat Sub-Division. Specifically, it seeks to analyze how indigenous practices, local resource management, and modern planning tools can be harmonized to promote adaptive capacity, economic empowerment, and food system resilience in rural Cameroon. By drawing on both empirical fieldwork and theoretical frameworks, the study contributes to rural development and policy discourse on sustainable agro-pastoralism in the context of climate change and socio-economic transformation.

MATERIALS AND METHODS

Research Design

A mixed-methods research approach was employed, combining quantitative surveys with qualitative interviews and focus group discussions. This design enables a comprehensive understanding of current practices, challenges, and opportunities within agro-pastoral enterprises. The study adopted a pragmatic paradigm, integrating both positivist and interpretivist perspectives to capture the multifaceted nature of agro-pastoral planning as previously used by Alharahsheh and Pius (2020).

Study Site

The study was conducted in Balikumbat Subdivision, one of the administrative subdivisions within the Ngoketunja Division of the North-West Region of Cameroon. Balikumbat is a historically significant area founded in the early 19th century by Galabe, the fourth son of Chief Gawulubi of Bali Chamba, following his father's death in 1830. The subdivision is renowned for its strong traditional authority, particularly under the leadership of Fon Doh Gahgwanyin III, who ruled from 1977 until 2012. The current traditional ruler is Fon Doh Gah Nyamnyin III.

Balikumbat Subdivision comprises several villages, notably Balikumbat (village), Bafanji, Baligansin, Baligashu, and Bamunkumbit. These communities are predominantly rural, with agro-pastoralism forming the backbone of their economy. Agriculture is not only the primary source of livelihood but also central to food security, income generation, and community resilience. The region's fertile lands and favorable climate support

the cultivation of key crops such as maize, beans, potatoes, and groundnuts, alongside livestock rearing, making it a vital agricultural zone within the Northwest Region. Geographically, Balikumbat is bordered to the east by Lake Bamendjing, an artificial reservoir created on the River Noun. The lake plays a crucial role in regional hydroelectric production, as it supports operations at the Songlulu and Edea dams. More importantly, the fertile shores of Lake Bamendjing serve as a major agricultural basin, making the area conducive to both crop farming and livestock rearing.

The agro-ecological conditions of Balikumbat characterized by fertile volcanic soils, moderate rainfall patterns, and proximity to a large water body make it an ideal setting for the study of sustainable agro-pastoral practices. Furthermore, the socio-cultural structures, including active traditional governance and communal farming systems, provide a unique context for understanding local project planning dynamics and sustainability strategies.

Population, Sampling Technique, and Sample Size

The target population for this study comprised agro-pastoral households located in the five principal villages of the Balikumbat Subdivision: Balikumbat (village), Bafanji, Baligansin, Baligashu, and Bamunkumbit. These communities are predominantly rural, with agriculture particularly agro-pastoralism serving as the cornerstone

of their livelihood systems. The population was considered known, based on informal estimates provided by local agricultural extension officers and traditional councils (Table 1). To ensure broad and fair representation, the study employed a stratified random sampling technique, with stratification based on the administrative boundaries of the five villages. The unit of analysis was the agro-pastoral household, selected due to its central role in the community's economic and subsistence activities.

Considering the estimated number of agro-pastoral households and taking into account logistical constraints such as time, accessibility, and available resources, a sample size of 150 households was deemed both statistically adequate for meaningful data collection. This sample was proportionally distributed across the five villages, reflecting variations in population density and intensity of agricultural activity. The approach ensured localized insights into agro-pastoral practices and development challenges while maintaining generalizability across the subdivision. This distribution ensures balanced coverage of both more populated and less populated communities, with weights reflecting the intensity of agro-pastoral engagement. Each sampled respondent was selected randomly within the village using community lists and with assistance from local agricultural extension agents.

Table 1. Distribution of Targeted Agro-Pastoral Farmers by Village.

Village	Estimated Agro-Pastoral Population	Sampled Farmers (n = 150)	Sampling Percentage
Balikumbat (village)	300	45	30%
Bafanji	250	38	25%
Baligansin	150	22	15%
Baligashu	150	22	15%
Bamunkumbit	100	15	10%
Total	950	150	100%

Source: Authors construct

Data Collection

Data were collected over a six-week period using a mixed-methods approach that combined structured questionnaires, semi-structured interviews, focus group discussions (FGDs), and direct field observations. The structured questionnaires were administered to agro-pastoral households sampled from the five main villages of Balikumbat Subdivision. These tools captured information on household demographics, farming characteristics,

planning practices, access to resources, and risk management strategies. Five enumerators one from each of the sampled villages were recruited through consultations with community leaders and local councils. Selection was based on their fluency in both English and the local languages, as well as familiarity with the sociocultural setting. Prior to fieldwork, a two-day training was conducted to equip enumerators with skills in ethical research practices, proper administration of data tools, and

interviewing techniques. This ensured consistency, accuracy, and reliability in data collection across the subdivision. In addition to the household surveys, 15 Key Informant Interviews (KIIs) were conducted to provide deeper contextual understanding. These included interviews with 3 agricultural extension officers, 4 traditional authorities, 4 farmer group leaders, and 4 local agricultural officials. The KIIs explored institutional support systems, traditional governance mechanisms, and policy-related issues affecting agro-pastoral planning and development within the region.

Five FGDs were also organized one in each village with 8 to 10 participants per group. These discussions provided space for community members to share collective experiences on planning challenges, indigenous knowledge practices, and resource management. Participants were selected to reflect a balance in gender, age, and farming experience, promoting inclusive dialogue.

Finally, direct field observations were conducted using a standardized checklist to assess elements such as farm layout, infrastructure, integration of crop-livestock systems, and the use of local adaptation techniques. These observations were complemented with field notes and photographs to enhance the validity of the data collected. All participants were engaged ethically, with informed

consent obtained and assurances of confidentiality and voluntary participation provided throughout the process.

Data Analysis

Quantitative data were analysed using SPSS Version 22.0 to identify patterns and correlations between project planning strategies and the performance of agro-pastoral enterprises. Descriptive statistics, including frequencies and percentages, were computed to summarize demographic data and key planning practices. Qualitative data from interviews and focus group discussions were analysed using a thematic analysis approach. This involved transcribing responses, coding key phrases, and identifying recurring themes related to sustainability, institutional support, indigenous planning knowledge, and risk mitigation (Inpin et al., 2023). The integration of both quantitative and qualitative findings allowed for a nuanced understanding of the planning strategies employed in agro-pastoral enterprises within the Balikumbat Subdivision.

RESULTS

The analysis of respondents' socioeconomic characteristics provides essential context for understanding their planning behaviours and enterprise performance.

Table 2. Socioeconomic Characteristics of Respondents (n = 150).

Characteristics	Category	Frequency (%)
Gender	Male	62
	Female	38
Age Group	Under 35	25
	36–50 years	45
	Above 50	30
Educational Background	No formal education	15
	Primary education	40
	Secondary education	35
	Post-secondary education	10
Household Size	Average household size (persons)	7
	Use of family labor	68
	Use of hired labor	32
Farming Experience	Less than 5 years	15
	5–10 years	30
	Over 10 years	55
Land Ownership	Customary rights	75
	Leased/Borrowed land	25
Access to Credit	Formal credit access	28
	No formal credit access	72
Extension Services	Regular contact with agents	34
	No regular contact	66

Author's Fieldwork, 2025

The data presented in Table 2 above indicates that the majority of agro-pastoralists in Ngoketunjia are male (62%) and fall within the economically active age bracket of 36–50 years (45%). A significant portion (40%) have only primary education, suggesting low literacy levels which may hinder formal project

planning. Most respondents rely on family labor and have substantial farming experience (over 10 years – 55%). Land is predominantly owned through customary rights (75%), and there is limited access to credit (only 28%) and extension services (34%), which limits exposure to modern project planning tools.

Table 3. Planning Practices Among Agro-Pastoralists (n = 150).

Rank	Planning Practice	% of Respondents	Remarks
1	Informal planning	65%	Relied on traditional cycles and personal experience
2	Documented planning	35%	Use of calendars, budgeting, and scheduling tools

Source: Author's Fieldwork, 2025

Table 3 shows that 65% of agro-pastoralists were engaged in informal planning, heavily relying on traditional knowledge and experience rather than structured project management tools. Only 35% were employing documented planning, which suggests a gap in formal project planning capacity that could be addressed through training and sensitization programs.

Table 4 shows that limited access to training (62%) and resource constraints (58%), such as access to capital and agricultural inputs were key challenges facing project planning. Climate variability is also a significant challenge (47%), highlighting the vulnerability of agro-pastoral activities to environmental shocks and the need for climate-resilient planning practices.

Table 4. Challenges in Project Planning (n = 150).

Rank	Challenge	% of Respondents	Remarks
1	Limited access to training	62%	Lack of formal education or technical agricultural training
2	Resource constraints	58%	Insufficient access to inputs, credit, and infrastructure
3	Climate variability	47%	Disrupts planting/harvest cycles; unpredictability increasing

Source: Author's Fieldwork, 2025

Table 5. Indigenous Strategies and Adaptation Practices (n = 150).

Rank	Strategy	% of Respondents	Remarks
1	Crop diversification	56%	Reduces dependence on a single crop and mitigates risk
2	Rotational grazing	50%	Maintains pasture health and reduces overgrazing
3	Traditional weather forecasting	32%	Based on historical observation; increasingly less reliable

Source: Author's Fieldwork, 2025

Agro-pastoralists employ several indigenous strategies such as crop diversification (56%) and rotational grazing (50%) to reduce vulnerability and improve productivity. However, reliance on traditional weather forecasting (32%) may be less effective given increasing climate unpredictability. These practices show resilience but also point to the need for integrating scientific planning tools with indigenous knowledge.

DISCUSSION

Socioeconomic Characteristics of Respondents

The study revealed a male-dominated agro-pastoral sector in Balikumbat Subdivision, with 62% of

respondents being men. This reflects gender disparities in access to land and livestock, consistent with Vitung and Anu (2024). Youth involvement was low (25% under 35 years), indicating aging farm populations and potential sustainability concerns, as noted by Avom et al. (2021). Educational attainment was generally low, with only 10% having post-secondary training. This limited literacy constrains the adoption of modern planning and record-keeping tools, supporting findings by Peleisa et al. (2024). Most households (average size: 7) relied on family labour (68%), which enhances labour availability but restricts scalability. Over half (55%) had over 10 years of farming experience, indicating strong local

knowledge. However, 75% farmed on customary land, which discourages long-term investments (Azibo et al., 2016). Access to formal credit (28%) and extension services (34%) was limited, echoing AFOP's (2012) report on weak institutional support. Overall, low education, insecure land tenure, and poor service access hinder effective planning and productivity. Gender inequality and youth disengagement further highlight the need for inclusive, youth-friendly, and well-supported agro-pastoral development strategies (UNDESA, 2022).

Planning Practices Among Agro-Pastoralists

Table 3 shows that informal planning dominates among agro-pastoralists, with 65% relying on oral or experiential methods, while only 35% use written tools like production schedules. This preference is likely due to low literacy levels, limited training, and strong trust in traditional practices. Similar trends were reported by Vitung and Anu (2024), who found low formal planning literacy in Northwest Cameroon. FGDs confirmed that decisions are often based on weather patterns and ancestral knowledge, with one participant stating, *"We trust the rains and the phases of the moon more than any modern techniques."*

Challenges in Project Planning

Table 4 highlights limited access to formal training (62%) as the main challenge to effective planning, followed by resource scarcity (58%), especially credit and inputs. Climate variability (47%) also disrupts production schedules, echoing Azibo et al. (2016) on farmers' vulnerability to environmental shocks. FGDs and KIIs reinforced these findings—farmers stressed the need for loans to invest in quality seeds and fertilizers, while extension officers pointed out that poor access to finance and modern tools hinders improved planning. Addressing these barriers requires integrated solutions involving training, financial access, and climate-smart tools.

Use of Indigenous Knowledge

Agro-pastoralists largely rely on indigenous practices like crop diversification (56%) and rotational grazing (50%) to manage risk and land sustainably. However, traditional weather forecasting (32%) is losing reliability due to climate change. As noted by Azibo, Kimengsi & Buchenrieder (2016), blending these

traditional methods with modern planning tools can strengthen resilience. KIIs with extension officers confirmed that while effective, these practices are rarely integrated into formal planning frameworks.

CONCLUSION

This study explored project planning strategies and sustainability challenges among agro-pastoral farmers in Balikumbat Subdivision, Ngoketunjia Division. Most farmers face challenges such as limited formal education, inadequate training, and resource constraints, which hinder their ability to implement effective planning. While traditional practices like crop diversification and rotational grazing help maintain resilience, they are insufficient for ensuring long-term sustainability. The study highlights the need for integrating traditional knowledge with modern planning tools and strengthening institutional support. Policies focused on training, resource access, and gender inclusion are essential to improving the sustainability of agro-pastoral enterprises. It is recommended that local councils and NGOs, establish community-based training programs focused on project planning and sustainable practices. These programs should be accessible, culturally relevant, and tailored to the educational levels of farmers to enhance their planning capacities and ensure long-term sustainability.

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