

Stakeholders' Interactions and Land Management Options in Bui Division, North West Region of Cameroon

ABSTRACT

The lucid engagements of stakeholders in land management is an essential strategy and a direct panacea to circumventing the stakes of land utilisation. This is symptomatic in ecumenes of intricate ecological traits with diverse stakeholders' management interests. Bui Division of the North West Region of Cameroon, a citadel of stakeholders enmeshed and is manning their respective lands with signatures of rare plausible interaction options in a decentralisation framework. As such, the study sought to assess the stakeholders' interaction options for land management in Bui Division. A historical and comparative research designs are used to obtain primary and secondary data from 1971-2021. This was through semi-structured, in-depth interviews from 10% of population in 504 households with consultation of published and unpublished documents. Data was analysed using quantitative and qualitative analysis. Findings reveal that multiple stakeholders' collaborative and participatory interaction options are positively apt in the diverse sectors of land management. The Anova analysis at a 0.05 critical level and a df of 7 shows calculated values of 0.9, 8, 3.9, 3.6 and 8.3 higher than the tabulated ratios of 0.65, 0.000, 0.001, 0.002 and 0.000 respectively. This indicates that there are significant differences in stakeholders' interaction options in land management based on stakeholders' activities and interests. The study posits that participatory interaction through multi-stakeholders' involvements and collaborations are the best options to condense the deprived perceptions of under representation of some stakeholders in land management platforms in Bui Division.

Keywords: Stakeholders, Land management, Interest, Interaction options, Bui Division

1.INTRODUCTION

Land is a symptomatic living space and the delineable area of the earth's terrestrial surface. It encompasses all attributes of the biosphere [1]. Salient land management (LM) portrays utmost stakeholders' interaction options and constituents as fundamental bases for human existence, survival and prosperity in ecumenes of difficult ecological traits [2]. [3] argued that LM throughout the history of planning have offered rare satisfaction to rural livelihoods based on agriculture. This is established on the main perception of land as the basis of wealth and power [4]. Such human perceptions anchored on geopolitical consternations, societal civilizations and technologies are hardly unidirectional and so in many cases breeds land management inconsistencies in varied parts of the world.

The stakeholders' options for LM in the developed world are inherent in interaction practices and options that coerces knowledge-based procedures in sustaining ecosystem services [5]. In Sub-

Comment [EK1]: Delete or review this expression. It's too affirmative

Comment [EK2]: Rephrase this sentence, it's not understandable

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Comment [EK4]: Review this last idea of the sentence. It's not understandable

Comment [EK5]: Starting a sentence directly with an author's quote is not very appropriate. It is advisable to quote the authors in the middle or at the end of the sentence

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Saharan Africa, the management stakes are fortress in reversing the trends of inappropriate LM practices. As pointed by [6], this is replicated in severe soil erosion, soil fertility depletion, water shortage, food insecurity and land degradation. Land management interventions options in this region are based on incompatible interests [7]. Management options are also predominantly regulatory and top-down, conferring limited options in focus to sustainable technology adoption and stakeholder participation. This incorporates the input of stakeholders in the process of sustainable management plans [8].

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Land management in Cameroon is driven by local and government stakeholders' as well as development agencies. Increased management emphasis is rooted on achieving the country's Strategic Development Plan, Rural-Agricultural Development and Sustainable Development Goals (SDGs). This is moored on development of policies, laws, institutional and legislative reforms established in the 1974 Land Ordinance (Law No 74/1 of July 1974) on land acquisition and the Decentralisation Framework of 2019 (Law N° 2019/024 of 24 December 2019) on local development. These trail top-bottom approaches with legacies replicating multidimensional patterns and ramifications of LM conflicts in the Northwest Region and Bui Division [9].

Such dire signatures are indicative of the necessity for a robust blend of multi-stakeholder/multi-sectorial and sustainable interactive options as primordial for incorporating the needs, interests and aspirations of stakeholders [10]. These interest are seen in the quest for livelihoods sustenance, good governance and transparency, environmental protection, village development, employment and the protection of customs and traditions. State laws This can be achieved through increased stakeholder participation in decision making, planning, implementing and evaluating stakeholders' activities as resonated by [11]. Land management practices are grounded on stakes [12], interaction options [9], differed interests and inequalities in the distribution land-based resources. These patent indicators involve multiple stakeholders' interaction options, approaches, institutions, laws, interests and outcomes [13].

This article considers stakeholders in Bui Division as any individual, groups or institutions that can affect or be affected by land in its natural or exploitative forms [14]. In this case, they include private individuals, government, civil society groups (NGOs, CIG and Village Development Associations), International Development Agencies, local leaders, and investors [15, 16]. These stakeholders form interactive broad-based coalitions that affect land and the resources therein through acquisition and utilisation (manage) for various purposes. This is founded in the stakeholder theory in the dimension of knowledge-based experiences in the land development options, and participation in land use planning as long-term stakeholders' options for sustainable LM [17]. Options are entrenched in LM assessment using the normative, descriptive and instrumental dimensions of the stakeholder theory (Freeman, 1984) cited in [12]. As such, the study sought to assess the stakeholders' interaction options for LM anchored on the premise that there are significant differences in stakeholders' interaction options for LM in Bui Division.

2. MATERIAL AND METHODS

Amid multi-sectorial, multi-stakeholder and diverse spatial premises for LM, the study was carried in Bui Division, situated in the North West Region of Cameroon (Fig. 1). It is located between Latitudes 6°00"-6°20" North of the Equator and Longitudes 10°30"-11°00" East of the Greenwich Meridian. The area has a surface of about 2160.9km² with population of 598.222 inhabitants as projected to 2021 from the 2005 BUCREP Statistics with an average growth rate of 2.7% per annum.

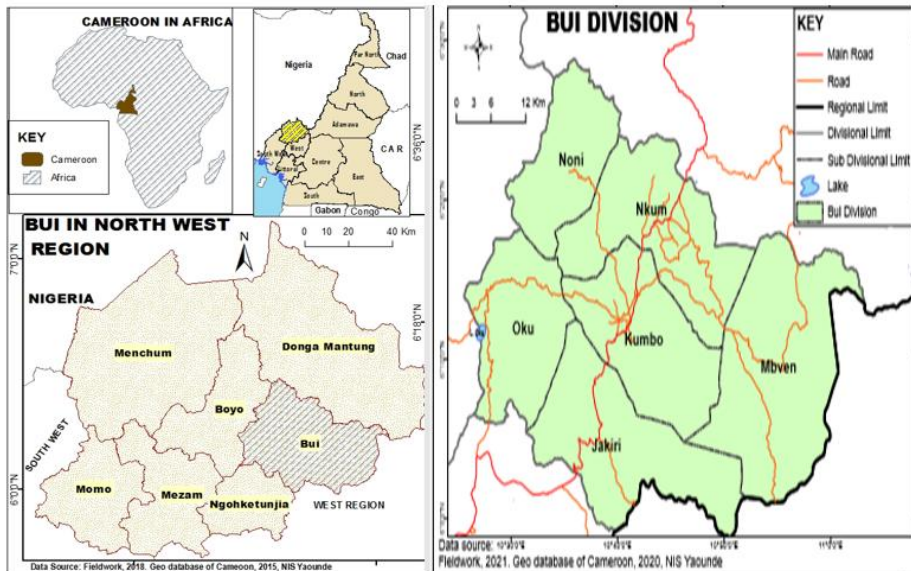


Fig. 1: Location of Bui-Division in the Northwest Region of Cameroon

Geographically and administratively, Bui Division covers six Sub-Divisions with three tribal communities having varying locations and land sizes (Table 1).

Table 1: Sub-Divisions and Tribal land communities in Bui Division

Tribes	Sub-Divisions	Geographical locations (XY)		Land surface areas (km ²)
		Longitude (X)	Latitude (Y)	
Nso	Jakiri	10°30"-11°00" E	6°00"-6°30" N	407.57
	Kumbo	10°00"-10°40" E	6°00"-6°10" N	334.64
	Mbiame	10°45"-11°00" E	6°00"-6°15" N	519.19
	Nkum	10°40"-10°50" E	6°10"-6°20" N	386.48
Noni	Noni	10°30"-11°00" E	6°00"-6°30" N	234.05
Oku	Oku	10°24"-10°36" E	6°00"-6°30" N	278.97
Bui	6	10°30"-11°00" E	6°00"-6°20" N	2160.9

Source: Field Survey (2020); [17]

It has diversified geographical characteristics which constitute components of land and management interaction options. It is a mountainous highland area characterised by an orographic plateau within the Cameroon Volcanic Line (CVL). The highland ranges from 710m-asl from the Mbaw-Tikar Plains to 3,011m-asl in Mount Oku. The area experiences the highland tropical climate of the Cameroon highland interior type with rainfall ranging from 2200mm to 3000mm. Bui Division has a growing population with 90% of the economic activities linked to LM (exploitation of cropland, built-upland, grazing land and forest land) as a means of livelihood.

Comment [EK8]: - You didn't mention the material used. Highlight in the development the list of equipment used.
- In addition, create a separate title for "Description of the study setting"

Comment [EK9]: The figures are blurry. Rework the images as much as possible to have figures with a lot of clarity

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A historical and comparative research designs were used to obtain primary and secondary data from 1972-2022. Semi-structured, in-depth interviews and questionnaires were used to obtain first-hand information from 504 households and LM institutions. Secondary data sources were gotten from published and unpublished documents from selected LM institutions where Reports, Laws, Decrees and past LM interactive experiences and options which were consulted. Institutions like Palaces, Councils, Civil Society Organisations, Sub-Divisional and Divisional Delegations linked to LM were consulted. Data was analysed using quantitative and qualitative analysis, while a spatial picture was based on Sub-Divisional and intercommunity stakeholders' interaction specificities. To compared the significant differences in the stakeholders interactive LM options the Anova Test at 0.05 critical level and a df of 7 was used for the empirical findings in the five periodical trends of the study.

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3. RESULTS AND DISCUSSION

3.1. Major stakeholders' interaction options for land management

3.1.1. Spatio-temporal evolution of stakeholders in land management

There are multiple stakeholders involved in LM in Bui Division. These stakeholders have multiple socio-ecological management stakes and challenges influencing the LM process. The stakes are hinge on conservation, land conflicts reduction, governance, multiple endemic land frontiers, topographic imperatives, Indigenous Knowledge Practices (IKP), marketing of land, sharing of benefits and community development. These stakes are considerations, specificities and the basis of stakeholders' interaction options for LM Bui Division. These stakeholders have evolved and changed in their typologies, temporal and spatial dimensions. There are variations in the patterns of distribution of stakeholders directly linked to LM such as farmers, agricultural experts, policy makers, administrators, politicians, religious bodies, Civil society organizations and international agencies (Fig. 2).

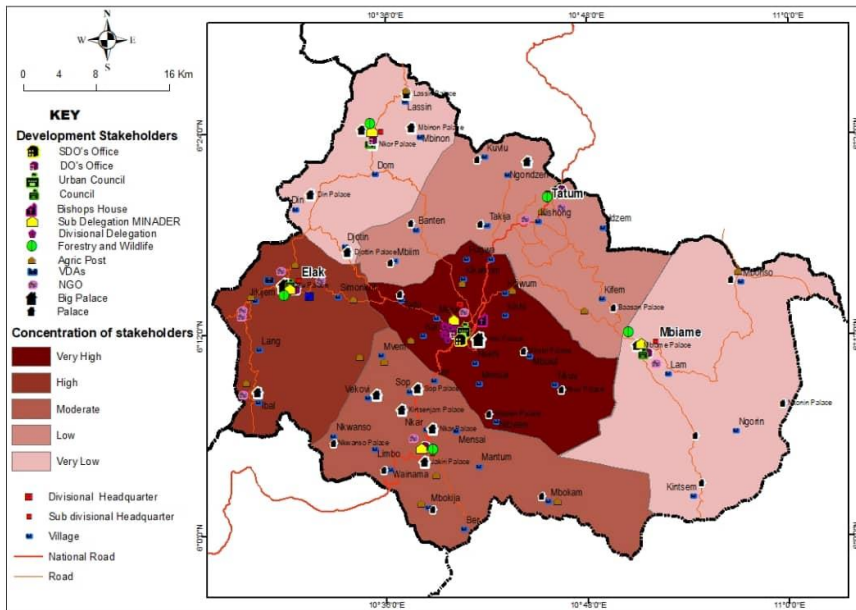
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- In the presentation of the results, use short transition sentences to move from one section to another.
- In this part, after the title "Results", the presentation of the results must be preceded by two or three short sentences to justify the methodology used and then attest to the veracity and validity of the results obtained.

Comment [EK16]: Please remove the underline

Comment [EK17]: I propose to delete this word "endemic"

Comment [EK18]: Mark a period (.) To signify the end of the sentence

Comment [EK19]: The sentence is confusing. There is confusion between actor and typology of land management. Try to rephrase the sentence. It must also be taken into account throughout the document.



Comment [EK20]: Figure 2 very difficult to read. Rework the quality of the figure to make it more readable

Fig. 2: Spatial distribution of stakeholders in land management in Bui Division

Most of the stakeholders are concentrated in Kumbo Sub-Division which is the Divisional headquarters with rapid population growth and diversity as the major urban settlement. The number reduces with increasing distance towards the rural area as in the case in Mbiame and Noni area. They are generally classified as endogenous (originated from within the tribal communities) and exogenous (external stakeholders) (Table 2).

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Table 2: Typologies of stakeholders in land management

Category	Stakeholders indicators	Number	Percentage
Endogenous (local)	Indigenous people (households)	55259	98.8
	Indigenous authorities	253	0.5
	Traditional institutions (Kwifon)	6	0.01
	Civil Society Organisation	411	0.7
	Municipal Councils	6	0.01
	Total	55905	100
Exogenous	State institutions (DDs and RDs)	12	44.4
	State Agencies and Parastatals	5	18.5
	External NGOs	5	18.5
	International bodies	5	18.5
	Total	27	100
Total	11	55934	/

Comment [EK24]: Attention, review all the values in the table. In addition, for all tables, use the new table formats without a separator line. Unless the present format is a specific requirement of the journal AJAEEs

Comment [EK25]: 55905, Erroneous value, are you sure of your numbers?

Comment [EK26]: What does 11 mean?

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Source: Field Survey (2021)

Internally, 98% of the stakeholders are indigenous people, most involved as they consider and depend only on land and the resources therein for survival. The land to the indigenous people is the ultimate prerequisite for sustenance and constitute significant natural, economic and socio-cultural assets to the population. They live in the abodes of land and directly engaged in LM through exploitation options and land uses. Externally, 44% are state institutions are more engaged in the LM process. They regulate the LM practices on legal and institutional frameworks. On the spatio-temporal dimensions, the LM stakeholders have evolved changed from 1971 to 2021 (Fig. 3).

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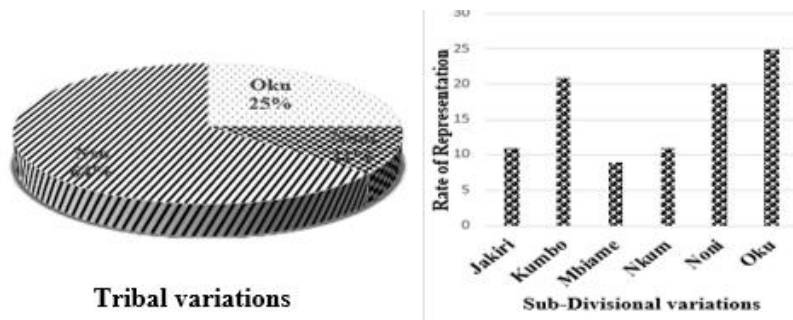


Fig. 3: Spatial variations in stakeholders involved in land-based resource management in Bui Division

Source: Field Survey (2021)

There has been an increase in the discovery of more resource potentials, ushering in multiple stakeholders into the LM process. In the period from 1971-1980, there were little potentials and trivial management options available for the population. Only indigenous people and few government representatives were available to dictate the pace of LM. From 1981-1990, there was an increase in stakeholders. This increase was justified by the 1987 forestland Decree with the government declaring the Kilum/Ijim forestland as a reserve. The range was more from 11-15 (40.7%) from 1991-2000 and 15+ in the range of 2011-2021 (46%). These positive changes were reflected on the increasing knowledge on the land potentials and LM options. There was substantial population increase and more state reforms that attracted external stakeholders through education and innovations practices. There has been the persistent upsurge of stakeholders in LM indicating multiple interaction management options over the years.

3.1.2. Legal and institutional regulatory options for land management in Bui Division

Land management options in Bui Division are based on legal and institutional tools. These tools are considered in order to prioritise the management stakes and challenges. (Table 3).

Table 3: Legal tools used in the Management of land-based resources in Bui Division

Legal tools	Land management Significance and applicability
International instruments	Sets the pace for the management of global lands and LM benefits through conventions.
State laws	Defines the legal and institutional frameworks for LM
Customary laws	Define the customs and traditions to ensure traditional land tenure security. Govern indigenous LM sanctions
Ancestral laws	Defines the taboo practices, norms and the methods of land acquisition through inheritance
Innovation practices	Ensures new sustainable practices and the dynamics in the management options. Introduces modern practices.
Traditional injunctions	Restrict some ill-adapted land uses. Refuses the right of ownership and exploitation of a particular land resource
Religious principles	Ensures peaceful inter-community coexistence among tribal communities in interaction LM options. Blesses the land regarded as a heavenly gift
Environmental laws	Ensures sustainable environmental practices and sustainable development of land resources
Total	/

Source: Field survey (2021).

Comment [EK29]: Figure 3 illegible, to be redone. Change the format, pattern and especially the colors to make them more readable and more expressive

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Generally, state instruments are the highly used in the LM process. The 22.6% relative representation is according to the Cameroon's legal framework where land has many dimensions with all unregistered lands and the resources therein are owned by the state. The legal instruments vary in applicability based on different dimensions of land (Table 4).

Table 4: Degree of applicability of legal instruments for land management

Laws and Decrees	Dimension	Context of Applicability
Law no 74/1 of July 1974	Land management	Organises the right of communities in Bui Division to own land. All land registration in this area passes through the SDO and DOs.
Decree no 76/165 1974 modified by decree no 2005/481 of 2005	Land management	Land should be occupied and exploited through only by those in possession of land certificates without which exploitation is on national and public lands which can be taken over by the state at any time.
Law no 94/01 of January 1994	Forest lands management	Gives rights to communities to own and exploit community forest lands. State has the responsibility to protect forests and reserves.
Law N° 96/12 of 5 th August 1996	Environmental and biodiversity resources	Basis for varied conservation practices of MINEPDEP, MINOF, MINADER and multiple Civil Society Organisations'
Decree 01/718/PM 3/9/2001 modified by N°. 2006/1577/PM of 11/9/2006	Forest and grazing lands management	Organising the functioning of the inter-ministerial committee on exploitation and use of biodiversity in forests and grazing lands.
Law No 2004/003 06/4/2002	Built-up land management	Prohibits housing development in areas of exposure and sensitivity to geo-hazards
Law No. 2004/003 of 21/4/2004	Urban Built-up land management	Regulate Town Planning by controlling housing development in urban areas through the issuing of building permits
Law No 99/014 of 22/12/1999	All lands	Provide the legal basis for the creation of the multiple Civil Society Organizations involved in LM.

Source: [17]

These legal provisions contain stakeholders' interactions pointing to the multi-sectorial/multi-stakeholders' LM options in the socio-cultural, economic and political domains. The Cameroon legal instruments contextually delineate the types of lands in Bui Division (Table 5).

Table 5: Categories of lands in Bui Division as per the 1974 Ordinance

Category of land	Cameroon standards	Land as in Bui Division
Private land (owned private individuals)	Registered, Freehold, Transcribed, concession and Grundbuch lands	Lands with pillars bearing number or land possessing Land Titles and other legal documents
National lands	Lands occupied by houses, farms, plantations, grazing, forests and all lands free of any effective occupation	Rural and urban built-up with no titles, farmlands, forested areas and grazed areas utilized by the indigenous populations
Public lands	Coastlands, waterways, Subsoil, air space, marsh and wetlands, lakes, roads, seas and airports, communication lines, public buildings and monuments as well as cemeteries, palaces and shrines	Cultivated marsh and wetlands as well as irrigated river banks and valleys. Associated components like climate that support the management of lands

Source: [17]; Field Survey (2021)

The contextualization of the legal options in Bui Division have resulted in the issuing of administrative authorisations by the state institutions for land utilisation. Civil authorities are considered as the custodians of the all the lands in the area. They are regarded as 'Chef Terre' (Head of Land). Stakeholders in most cases are already recognized and given authorisations to carry out specific LM practices. The national legal frameworks have been used to draw up field legal frameworks by the

Comment [EK36]: New table style, Same as table 3, add additional sources please. If not, it gives the impression that you have copied the table into a document. But if the work is oriented on the reports of the same project, it is accepted.

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- New table style
- Additional sources or references if possible

authorities concerned. This is seen in the varied number of Municipal, *Prefectorial* and *Sous-Prefectorial* orders for LM options. Additionally, there are also indigenous interaction regulatory options for LM in the different tribes. The variations in the rate of application are a function of IKP (Fig. 4).

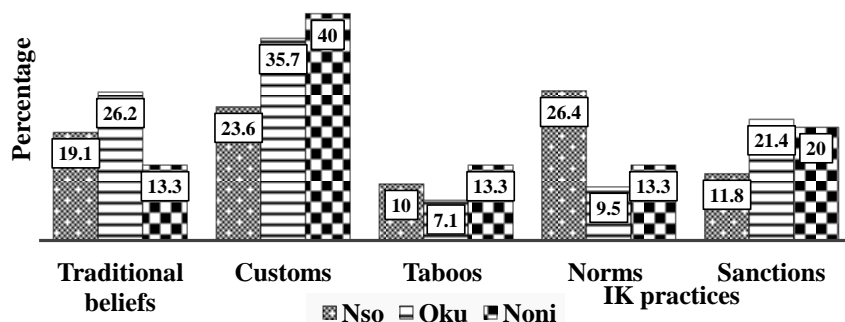


Fig. 4: Degree of application of IKP in the tribal communities

Source: Field Survey (2021)

Customary practices are the basis of the development of the IKP s of the population in the LM process. This is linked to the level of civilization and literacy of the population. The Nso population is more exposed and adaptable to LM innovations options which are not only based on traditions but on modern national, regional and international dispensations. The low application of taboos as a LM regulatory option is strongly imbedded on the consequences of the non-respect of some traditional LM practices based on indigenous norms.

3.1.3. Stakeholders responsive options in land management

The general interaction options for LM are reflected in the implementation and decisions on LM practices. This involves the stakes, concerns, activities and interests of the stakeholders. Stakeholders' interactions options are manifested in management indicators of land acquisition and utilisation. The process and rights of stakeholders to own land in Bui Division are entrenched Ordinance No 74-1of 6th July 1974. This law defines the procedure of land ownership and the stakeholders charge with land acquisition and distribution (Table 6).

Table 6: Stakeholder charged with land acquisition and distribution in Bui Division

Stakeholders	Roles in land acquisition and distribution
Fon	Permanent member in land distribution, highest traditional authority in land tenure determination
Village council	Judge land matters in the villages, execute the Fon's orders, punishes defaulters who violet tenure laws
Village head	Member in land registration, allocates and distribute land for public use, receives and treats petitions on land matters
Quarter head	Same functions as the village head but in a limited scope. Charged with installing and removing injunctions on land
SDO/DO	Permanent member in all the commissions charged with land registration. Chairman of the land consultative board
MINDCAF	Permanent ministry in land registration and distributions. All chiefs of services like the DCL, DCS, DCLT determine the land registration procedures as defined by law.

Comment [EK38]: - Diagram to be repeated. The different axes (abscissa; ordinate) must appear clearly to facilitate reading

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Council (Mayor)	Member of the site board chairman and surveillance commissions in land distribution. More involved in urban and public land development
Landlord	More involved among others in land speculation. They buy and sell land. Involve in the signing of sales certificates
Family Head	Highest authority in taking decisions over family land assets. Determines the inheritance rights of the family.
Total	/

Source: Field Survey (2021); [17]

The family head is the highest stakeholder in land acquisition and distribution. The 21% relative rate is linked to the fact that the population in Bui Division is very much embedded in the traditional methods of land acquisition and distribution. By this method of land tenure, only the family head gives out land to family members. Based on this indigenous practice, the 1974 Ordinance and the 1984 amendment provisions defines the commissions in land registration process (Table 7).

Table 7: Land registration commissions in Bui Division

Commission	Stakeholders	Status	Functions
Site Board Commission	SDO	Chairman	Determines the extent of implementation of state laws and regulates the activities of the commission. Delegate powers to members
	DCSL	Secretary	Take down minutes on issues and documents registration process
	DOs	Member	Allocates land for specific functions in the area
	DD MINADER	Member	Determines the agricultural potentials of land
	DD MINEPIA	Member	Defend the rights of the grazers
	MP	Member	Defend the rights of the people in land exploitation.
	Mayor	Member	Produces the land use plan for the municipality to guide the commission members. Building permits
	Fon 2 notables	Member	Allocates land and determines the land tenure Assist the Fon and confirm the traditional tenure laws. Ensures the respect of tenure rights
Land Consultative Board	DO	Chairman	Determines the procedure of operations and local functions of members. Signs legal documents
	DCLT	Secretary	Take down minutes on issues and documents registration process
	DCS	Member	Ensures the technical specificities by measuring and planting the pillars
	Fon 2 notables	Member	Allocates land and determines the land tenure Assist the Fon and confirm the traditional tenure laws. Ensures the respect of tenure rights
	Surveillance commission	DO	Chairman
DCS		Secretary	Ensures the technical specificities by measuring and planting the pillars
Mayor		Member	Produces the land use plan for the municipality to guide the commission members. Building permits
Village head 2 notables		Member	Confirms the right of ownership of land by individuals Assist the Fon and confirm the traditional tenure laws. Ensures the respect of tenure rights

Source: Field Survey (2021); [17]

Considering the fact that indigenous stakeholders constitute a majority of the stakeholders in land management regulated by state instruments, the distribution of land is based on the traditional and modern land tenure rights unique in all the tribal communities. These communities have a similar ancestral origin. The acquisition and use of land is based on the different land tenure systems practiced in this area (Fig. 5).

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- Kindly harmonize

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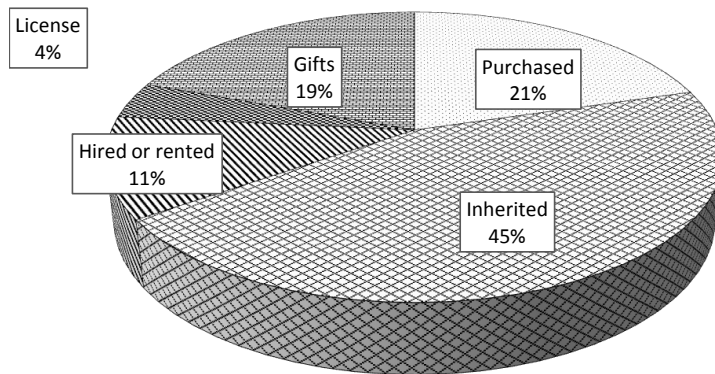


Fig. 5: Land tenure options in Bui Division

Source: Field Survey (2021); [17]

Inheritance (45%) is the main method of land acquisition in Bui Division. This is explained by the fact that the indigenous tribal communities believe in land being ancestral land. The family head hands it down to the successors. Acquisition is marked by land grabbing high in pioneer fronts like Mbonso, Mbokam, Chaah, Banti and Buukuh. Land is also bought by the wealthy for large scale farming and investments. Interaction management options are reflected on the spatial dynamics of stakeholders' activities and rate of intensities (Fig. 6).

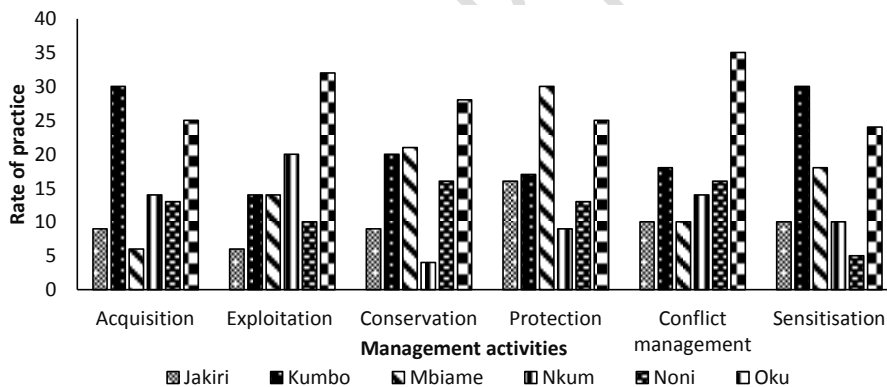


Fig. 6: Spatial dynamics in stakeholders' management options

Source: Field Survey (2021)

Land acquisition is more a management option in Kumbo and Oku Sub-Divisions. The 30% and 25% respective variations are seen in the different rates in the acquisition of land titles and building permits in Kumbo. In Oku, the high scarcity of land in a sensitive mountainous community. This is the most mountainous zone of the division and part is forested land and protected from encroachment. Land scarcity necessitates a rising stake in acquisition and utilisation. This is the basis of LM in the area skewed more on conservation of endemic land resource frontiers admits a growing population in a precipitous environment. Another significant specificity in LM options is protection and sensitisation dominant in Mbiame, Kumbo and Oku Sub-Divisions. Interaction stakeholders' options have dynamics

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with increased Civil Society Organisations and the state institutions. Varied interactive management optional signatures are therefore striking in diverse domains (Table 8).

Table 8: Sectorial stakeholders' interactive land management options

Category of land	Major sectorial stakeholders	Management specificities
Land and fertile soils	Population, Councils, SDOs, DOs, MINCAF, MINADER and MINEPDED, MINDUH Kwifon, CIGs, VDAs, CBOs	Land use planning, crop cultivation, training and sensitisation on sustainable environmental agricultural practices, administrative and traditional orders, town planning regulation, building permits, land registration, Organise water and land conflict mitigation, regenerate vegetation, prohibit destructive activities, training and river bank protection, administrative and traditional orders.
Forestlands	Population, Council, DOs, Kwifon, MINOF, FMIs, NGOs, CIGs, VDAs, CBOs International bodies	Reforestation, fires tracing, regeneration, sensitisation and elimination of eucalyptus trees, administrative and traditional orders, exploitation of forest resources
Agrarian lands	Grazers, MINEPDED, MINEPIA, DOs, Kwifon, MINCAF, CIGs, VDAs, CBOs	Land use mapping and training on pasture production, administrative and traditional orders, raising of livestock

Source: Field Survey (2021)

On a general perspective, most land use options in the different periodical trends are based on rural land uses. Large scale agriculture for grabbed lands exist in the hollow frontiers, unsettled areas and pioneer fronts. Cultural land use options reflected in IKPs were most dominant before 1980 (40%) and dropped sharply from 1990 to 2020. The exploitation of varied medicinal plants thrived a source of healthcare delivery to the population in this period. This is seen in the Kilum/Ijim Wildlife Sanctuary that is highly protected and conserved. Management of rural settlement space was also dominant with all settlements before 1980 and 1981-2000 being rural except Kumbo as the Divisional headquarters. Changes occurred from 2011-2020 as all the 6 Sub-Divisional headquarters today are urban centres.

The **DOs** and the *Kwifon* are involved almost in all categories of lands considering the sectors' specificities. The laws and constitution of the Republic of Cameroon give the **DOs** the right to represent the Head of State in their areas of command with the ultimate powers to control all the lands. The *Kwifon* is the supreme authority, traditional parliament and custodian of the tradition in the tribal communities of Bui Division. They are charge with the main tenure decisions concerning land exploitation options.

3.1.4. Spatio-temporal analysis of stakeholders' interactive management interests

There are spatio-temporal variations in stakeholders' interests LM. This is a function of the different stakeholders' interaction options in the LM process. The evolution and rate of change is driven by the multiple stakeholders with varied socio-cultural, economic, political and IKP towards the significance of the different categories of lands (Table 9).

Table 9: Spatial variations in management interests of stakeholders in Bui Division

Stakeholders' interests	Jakiri		Kumbo		Mbiame		Nkum		Noni		Oku	
	F	%	F	%	F	%	F	%	F	%	F	%
Livelihood	18	31.0	21	19.1	1	2.0	16	15.7	1	25.0	33	26.2

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Environmental	7	12.1	11	10.0	7	14.6	15	14.7	8	13.3	12	9.5
Political	4	6.9	15	13.6	1	25.2	35	34.3	1	25.5	12	9.5
Village development	10	17.2	21	19.1	6	12.5	14	13.7	7	11.7	21	16.7
Employment	10	17.2	23	20.9	3	6.3	7	6.9	4	6.7	36	28.6
Customs and traditions	4	6.9	13	11.8	3	6.3	11	10.8	4	6.7	6	4.8
State laws	5	8.6	6	5.5	5	10.4	4	3.9	7	11.7	6	4.8
Total	58	100	110	100	48	100	102	100	60	100	126	100

Source: Field Survey (2021)

The conspicuous dominance of the livelihood interests between 1971-1980 and 1991-2000 is reflected in the percentage changes in the different periods at 100%. The anomalies are explained by the fact that, the introduction of multiple stakeholders in the management process have been shifting the LM paradigm from one interest to another based on communities' aspirations. Generally, livelihood and employment are the main interests of the stakeholders in LM. The population highly depends on land exploitation for survival. This is the basis for the practice of agriculture, grazing, construction and forest exploitation by 98% of the population in Bui Division. The socio-cultural (healthcare and cultural aspirations) significance of land has an interactive economic connotation for meeting the demands of the population. On the spatial dimension, Jakiri Sub-Division has most of the livelihood interest (35%). Nkum has the highest political interest (34%), seen in the cosmopolitan nature of the tribe and the proximity to the tribes like Noni and Wimbun with dissimilar cultures.

3.1.5. Significance differences in stakeholders' interactions land management options

To compare the significant differences in the multiple stakeholders' interaction options for LM, the premise of the study was used based on the Anova analysis. Framed on the concept of stakeholders, the operationalization of this concept pointed to multiple stakeholders having diverse interaction options for LM. Calculations are done at a 0.05 critical level at a df of 7 (Table 10).

Table 10: Anova Test for multiple stakeholders' interactions in land management

Multiple stakeholders interactions	ANOVA					
		Sum of Squares	df	Mean Square	F	Sig.
Stakeholders in land distribution (1971-2020)	Between Groups	33.015	7	5.502	.894	.654
	Within Groups	3938.787	497	7.925		
	Total	3971.802	504			
Decisions making (1970-2020)	Between Groups	161.929	7	26.988	7.98	.000
	Within Groups	1680.910	497	3.382		
	Total	1842.839	504			
Traditional institutions (1970-2020)	Between Groups	53.121	7	8.853	3.92	.001
	Within Groups	1120.782	497	2.255		
	Total	1173.903	504			
State stakeholders (1970-2020)	Between Groups	40.584	7	6.764	3.60	.002
	Within Groups	931.884	497	1.875		
	Total	972.468	504			
Local development actors (1970-	Between Groups	54.670	7	9.112	8.27	.000
	Within Groups	547.322	497	1.101		
	Total	601.992	504			

Comment [EK49]: No title underline

Comment [EK50]: Review the format of Table 10

2021)						
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Source: Field Survey (2021), Generated in SPSS V20

The calculated Anova Ratios are 0.9, 8, 3.9, 3.6 and 8.3 (approximated at one decimal place). The significant corresponding values in the Anova Table at a 95 Confidence Level are 0.65, 0.000, 0.001, 0.002 and 0.000. Comparing the calculated values and the tabulated ratios, the former is greater than the later. This means that the alternative hypothesis is accepted which states that there are significant differences in stakeholders' interaction options for LM in Bui Division. This is supported by the general increasing trend of management stakeholders' typologies, interaction activities and interests that culminate spatial differences in LM management options in the interaction process.

3.2. Discussion of results

The LM process has been driven by multi-sectorial and multi-stakeholder interaction options based on management human stakes. This is indicative in the significant differences in the interactions options for LM land by different stakeholders [12, 5, 14] who considered the role of physical environmental human dominant stakes as dominant in the management of farmlands for rural development. Field evidence portray 98% of endogenous stakeholders being indigenous and 44% of external stakeholders being state institutions. These stakeholders with an increasing trend use multiple interaction options for LM based more on state institutional regulatory mechanisms [15, 16, 18]. There are dynamics in LM responsive propensities with more relative efforts tilted towards land acquisition, land exploitation and land conflicts management [9]. These LM options are interactively responsive, and significantly addressing 85% of the management stakes as echoed in multiple analyses of [7, 16, 18]. These have bestowed optimistic management signatures reflected in the increasing livelihood options, innovation diffusion in land exploitation and efficient land service provision for population sustenance and survival. This is in line with the study of [1, 2] who positioned that the efficient manage of land and the resources therein is an essential prerequisite for the survival of the population in ecumenes of intricate resources frontiers. Management options have been improved through land use planning [6, 8] for efficient utilisation of land for different land uses for the benefit of all and sundry.

3.3. CONCLUSION AND RECOMMENDATIONS

Land management options are marked by the dynamic trends of multi-stakeholders and multi-sectorial interventions to address the stakes identified. Interaction options are reflected on management predispositions based on stakeholders' interests that vary at spatio-temporal scales. Positive interaction outcomes (85%) are seen on the increasing participatory approaches of the stakeholders' interactions. Management approaches from 1971-2021 are indicative of the dominating influence of indigenous stakeholders (60%). The Anova analysis at a 0.05 critical level at a 95 confidence level with a df of 7 reveals ratios of 0.9, 8, 3.9, 3.6 and 8.3 which are significantly higher than the corresponding Table Values of 0.65, 0.000, 0.001, 0.002 and 0.000 respectively for the LM interaction options. This confirms the hypothesis concluding that interaction options for LM are significantly different and directly based on stakeholders' activities and interests. This establishes a

Comment [EK51]: - In the wording of this title delete "of results" and simply keep "Discussion"
 - The discussion (1/2 page) is too short compared to the results (8 pages). This shows an imbalance in the work which is too noticeable. Try to develop the discussion part a little more.
 - This discussion part has two axes, namely the comparison of the results with those of previous work and then the explanation of the concordant and divergent results. In your efforts, we do not clearly perceive these two sequences. We invite you to reformulate the discussion part completely.

Comment [EK52]: - Close the hook

Comment [EK53]: - The conclusion part is not numbered. Delete number 3.3.
 - The title of this part is entitled "Conclusion and Recommendations". In development, you didn't mention the recommendations. It is then necessary to delete recommendations in the wording of the title. The title is now: "Conclusion".
 - Finally, we must leave in the conclusion some applications of the results obtained

strong positive correlation between LM options and stakeholders' interests with 78% more of livelihoods. Considering the inseparable nexus between stakeholders' interaction options for LM and stakeholders' interests, the study posits that participatory [8, 10, 11] LM is the best approach to reduce the problem of under representation of stakeholders in land resource management platforms. This is suggestive of the fact that indigenous stakeholders' responsive options in LM, plausible in multi-stakeholder and multi-sectorial interaction arenas are a direct panacea to circumventing the stakes of LM in local communities. Intercommunity interdependence in trans-boundary LM should be primordial. Such commonplace exertions can promote sustainable interactive LM options in sensitive milieus where the defiance of space occupancy and land developmental dilemmas are still exacerbated.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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Comment [EK54]: - Proofread the references to harmonize. Standardize a single style in the bibliography according to the "Asian Journal of Agricultural Extension, Economics & Sociology" requirements.
- If possible, try to provide more references.

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