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Evaluation of Land Use Conflicts and Management Options in Tubah Sub-Division, North West Region of Cameroon

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Abstract:- Land is central to human existence, socio-economic development and wellbeing of the people. Paradoxically, land is put under intense pressure from multiple vagaries. These have generated land use conflicts as the different land use types turn to conflict each other with far reaching implications. Such conflicting claims regarding rights to ownership of land have, over the years led to multiple types of conflicts in different communities including Tubah. This paper evaluates the conflicting land uses in Tubah Sub-Division, the types and manifestations of conflicts and propose management options. A cross-sectonal multiple data collection techniques were used to elicit and urbanization among others. Moreover, these conflicts have had tremendous consequences ranging from destruction response on land use conflicts, manifestation and management options. Results indicates 6 types of land use conflicts in Tubah Sub-Division which include farmer-farmer, grazier-grazier, forest-farmer, farmer-settlement and watershed-farmer-grazier conflicts with the main type being the farmer-grazier conflicts. Their manifestations were in response to changing demand in agricultural products, restricted access and emerging opportunities from settlement expansion of farmlands, killing of cattle, reduction in water quality and quantity for downstream users amongst others. This situation greatly calls for more efficient and effective land use conflict strategies through land use planning measures to achieve optimal balance between competing interest, multiple land user and the use of un-ideal land. Also, with proper education and sanitization, effective collaboration among stakeholders, the use of skillful actions in ensuring conflict resolution could be achieved. Finally, local inclusion in decision making processes, property right and the empowerment of local institutions among others measures to ensure sustainable land management should also be encouraged.

Keywords:- *Land Use, Conflicts, Land Use Conflicts, Conflict Resolution, Tubah Sub-Division.*

I. INTRODUCTION

Land is a fixed factor of production whose quantity does not increase with increasing population. Land is central in human existence and development. Since their appearance on earth, humans have used land and its resources (biosphere) to meet their material, social, cultural and spiritual needs (1; 2). Therefore, human actions rather than natural forces are the source of the most contemporary changes in the state and flow of the biosphere (1). 3 defines land use as the function of land units, notably the human use, which often has economic significance. Even though land is a fixed factor of production; the processes that take place on the land are dynamic. 4 defines land use dynamics as conversion of land from one form to another. It is estimated that nearly 50% of earth surface has been significantly transformed through human activities (5). Therefore, understanding these actions and their socio-economic forces are crucial to understanding environmental changes, vulnerability and management of such changes.

Land although ubiquitous, is the main source of conflicts between its occupants, stakeholders and government across the world (6). Land per say is not the problem but the various activities carried out on it to ensure livelihoods pose a serious problem amongst land users and stakeholders. 7 defines conflicts as contradictions generated by differences in needs, interests, values as well as access to power and resources because of ethnicity, religious, political and class. Conflicting land uses arise from the fact that, land has multiple uses which range from agriculture, a major user of land resources to settlement usually the most pressing need for living space for the growing population (8). The growing demand or the products of the land is likely to continue growing in the foreseeable future especially in developing countries due to population increase, economic development and rapid urbanization precipitating conflict and productive and protective capacity of the resources (9). Therefore, maintaining the capacity of the land to continue to sustain demand could remain of fundamental importance especially for many developing countries where expansion of economic activities through agricultural lands to urbanization, tourism, forest development and settlement expansion, poor planning and management are severely bringing with them tremendous pressure on soil, water and vegetation through encroachment and uncontrolled planning (10).

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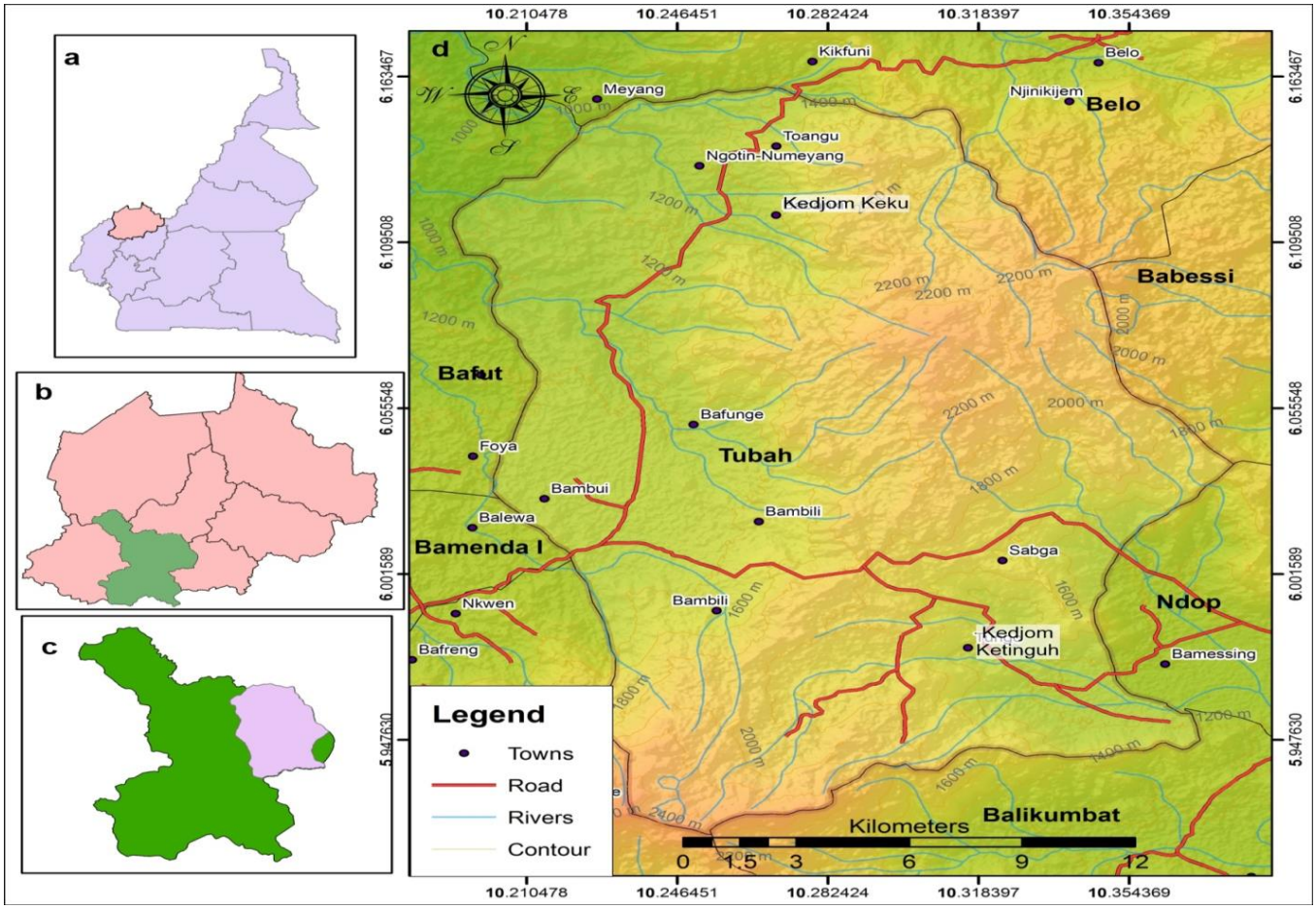
The North West Region of Cameroon and Tubah Sub-Division in particular is not an exception to this cacophony. The one-time physical environment in this region and its environs that knew little or no stress prior to the 1980s has witnessed a progressive change in it land use over time. Land conflicts in Tubah may stem from the fact that the population of this region is rapidly increasing (geometric rate) oppose to land which is fixed in supply. For instance. the population of Tubah increased from 29,192 in 1976 to 54,000 in 2000 (Regional Service of Statistics and Surveys, NWR, Bamenda, 2005) and a further increase to about 65,250 (11). This has resulted to continuous expansion into the farm and grazing lands by plantation forest, capitalist-industrial activities and settlements. Significantly, agriculture accounts for over 72% of labour force in the study area more than the national average. However, in the last few years, land degradation, technological innovations, changing lifestyle, poverty and economic development resulting from in-migration have resulted to restricted use of land, in-accessibility and low income. This has resulted to many recurrent conflicts among land users.

Overall, the situation could be worrying due to population pressure on land, with the average agricultural landholding mostly rainfed reducing or over taking by other non-agricultural activities like tea production and local forest plantation. These expansionist tendencies over land could lead to land use conflicts and environmental changes with severe implications on human livelihoods and environment. Also, the intensification and divergence use of land, inadequate legislature guide-lines, limited spatial data on land use and land capability studies, limited information could continue to remains the source of the perennial agro-pastoral conflicts in Tubah Sub-Division. The types of land use in the area arise naturally in a culture, through its customs and practices. Tubah Sub-Division, having its own culture has its own land use types, such as farming, grazing, residential, and forest cover. Certain groups such as the low-income segment of the society continue to experiences both social and spatial marginalization which tends to encourage conflicts if rules and regulation regarding resource use and access are not clearly defined and implemented to ensure equal opportunities and access. Consequently, the focus of this paper is to evaluate the conflict related land uses taking place in Tubah Sub-Division, the types and manifestations of land use conflicts and to proposed managements strategies for conflict resolution to ensure efficient, effective and sustainable land use planning. This knowledge is important and essential for strengthening land users and stakeholders so that they could be able to use and manage the land resource sustainably for the wellbeing of the population.

II. MATERIALS AND METHODS

2.1 Study Area

Tubah Sub-Divisions is located in the Mezam Division in the North West Region of Cameroon located between Latitudes 4°50’ to 5°20’ North and Longitudes 10°35’ to 11°59’ East of the Greenwich Meridian. It is bordered to the North by Belo in Boyo Division, to the North West by Bafut, to the South and South East by Ndop and Balikumbat in Ngoketungia Division and to the West by Nkwen in Bamenda III Sub-Division (Map 1). It has a surface area of 388.75km^2 giving a population density of 145 persons / km^2 (11). Tubah is made up of four main villages; Bambili, Bambui, Kedjo-ketinguh and Kedjom-keku. An appropriate land use and land cover classification scheme was developed for the study area after (6), which takes into consideration the characteristics of the area. The different land use classes include; farmlands, grazing lands, settlement land and forest cover. This beyond doubt could directly or indirectly drive conflict among and between different land uses. The population and housing census in 2005 estimated the population of Tabah Sub-Division at 57,326. This has increased from 65,250 in 2010 to over 73,890 in 2013. Therefore, the continue increase in population from natural increase and migration in recent years has triggered land use conflict due to intense pressure on land and its resources.



Map 1: Tubah Sub-Division in Mezam Division, North West Region of Cameroon
Source: Adapted from (2)

2.3 Materials and Methods

A series of reconnaissance surveys were carried out by the researcher to have an insight to the different land uses that drive conflicts in the area. The Supervised land use classification method was used after 6. Based on the priori knowledge and reconnaissance survey with additional information from previous research in the study area, four main land use classes were identified, namely, farmland, grazing land, forest cover and settlement land.

Questionnaires were administered to probe the minds of the people about the main land uses that cause conflicts and the types of conflicts. Field observation was also integrated with the result from the remotely sensed data to make land use change result meaningful. Land use maps were produced using some GIS software packages such as Google Earth, ENVI 4.3, Global Mapper 15 and ArcGis 10.2. Landsat image Files of 2001 and 2021 were downloaded and the various bands for each year were modulated and corrected to reveal settlements, roads, farmlands and other geographic features using ENVI 4.3. These images were later exported to Global Mapper 15 where the visible features of interest were digitized and their shape files exported to ArcGIS 10.2 where they were assembled together with the raster and elevation data to produce the maps for each year. The polygons representing the various parameters were measured using ArcGIS 10.2 and computed using M.S Excel 2020. To understand people's views related to land use dynamics, conflict and management, and open and semi structured interviews were conducted using simple random sampling technique. As a result, 200 questionnaires were administered to household heads from the four villages and a review of secondary data from administrative reports of stakeholders were carried out. The data collected were analyse with the aid of Statistical Package for Social Sciences (SPSS) and Microsoft Excel and were descriptively presented using tables, figures and maps

III.. CONCEPTUAL FRAMEWORK

The Pressure-State-Response (PSR) framework (Figure 1) put forward by the 12, adopted for this study states that *''human activities exert pressure (land use changes) on the environment, which can induce changes in the state of the quality and quantity of the environment (land use conflicts or environmental degradation)''*. Society then responds to the changes in the pressures or the state with environmental and economic policies/programs intended to prevent, reduce or mitigate pressures and/or environmental damage. PSR framework highlights these (causal) linkages, and helps decision-makers and the public to see environmental and other interconnected issues. In the case of Tubah Sub-Division, increase in population and poor land management has exerted pressure on the land resources which has resulted to land use conflicts and other

environmental problems thereby changing the state of the land. In response to these changes in the state of the land policies and programs have been put in place for conflict resolution.

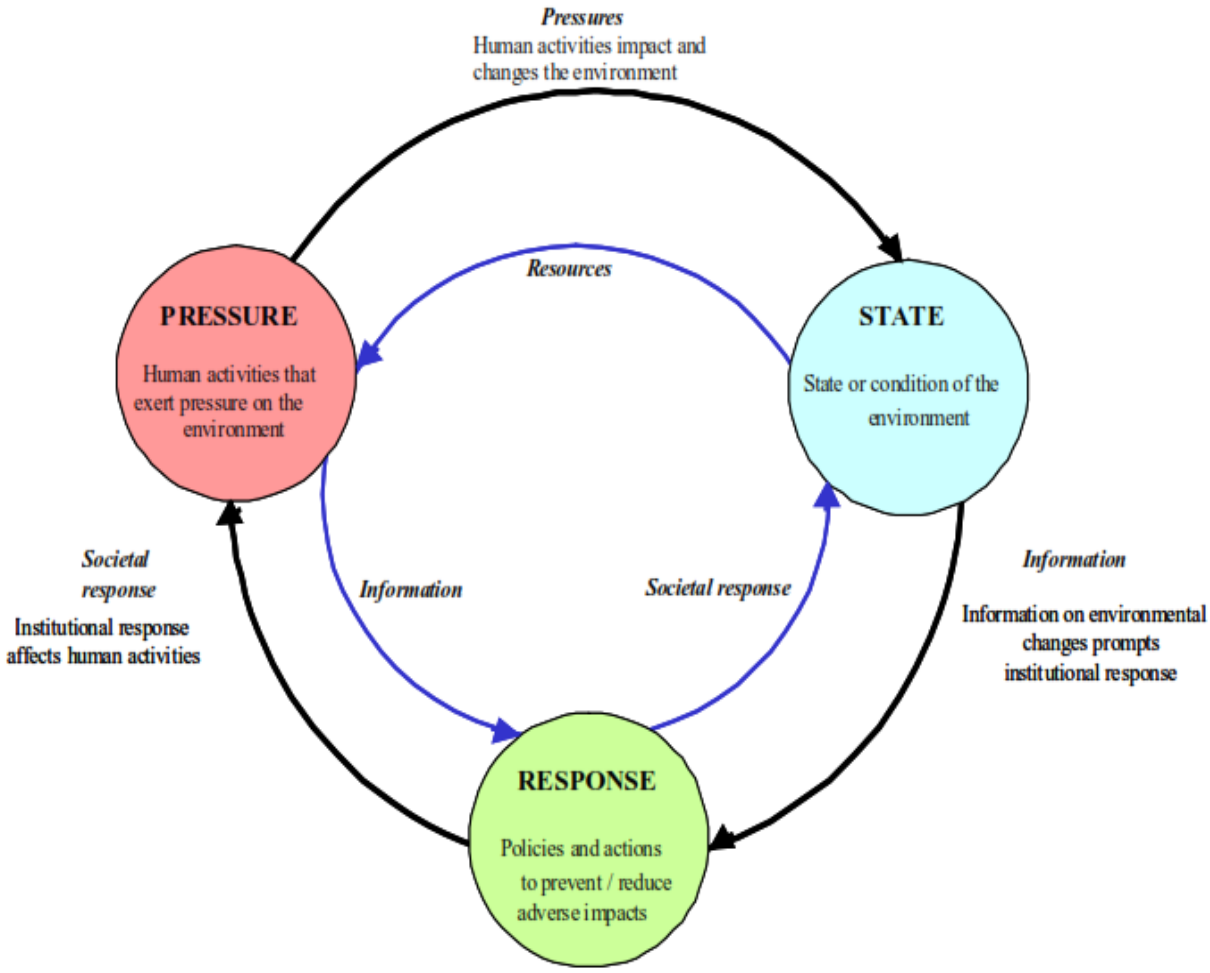


Figure 1: Pressure-state-response (PSR) framework
Source: 12

Therefore, understanding the conflicting land uses is recognized by this study as one of the key ingredients for urban planning. Throughout history, changes in population and climate have stimulated land use changes which has in turn stimulated conflicts over land resources, Tubah Sub-Division is not an exception. Land is our sustenance, thus, if land is in conflict, so we are. This situation greatly calls for a sustainable land management.

IV. RESULTS AND DISCUSSIONS

4.1 Conflicting Land Uses in Tubah Sub-Division

Land use in Tubah Sub-Division has significantly evolved over time with the main land uses including forest cover, farmlands, grazing and settlement lands. From the Land use Map of Tubah Sub-Division (Map 2) for 2001 and 2021 indicate a positive and negative change situation. With regard to farmland, it witnessed a positive steady decrease from 91.83 km^2 in 2001 to 64.47km^2 in 2021. Built-up area faced a rapid positive increase in surface area coverage from 15.25km^2 in 2001 to 21.23km^2 in 2021. Forest cover in Tubah Sub-Division indicated a negative drop in the area coverage from 61.44km^2 to 37.01km^2 in 2021. Grazing land in Tubah Sub-Division also witnessed a slight increase in its surface area from 91.83km^2 to 265.69km^2 in 2021. This land use changes indicate the conflicting interest over land between the inhabitance in Tubah Sub-Division from 2001 and 2021 (Map 2, Table 1). This corroborates the findings of 1 on urban expansion and loss in agricultural land-GIS based study of Saharanpur City in India where the author used remote sensing combined with field checks and survey measure to examine the loss of agricultural lands to urban expansion between 1988 and 1998. Non-agricultural activities especially settlement was responsible for most of the agricultural land losses.

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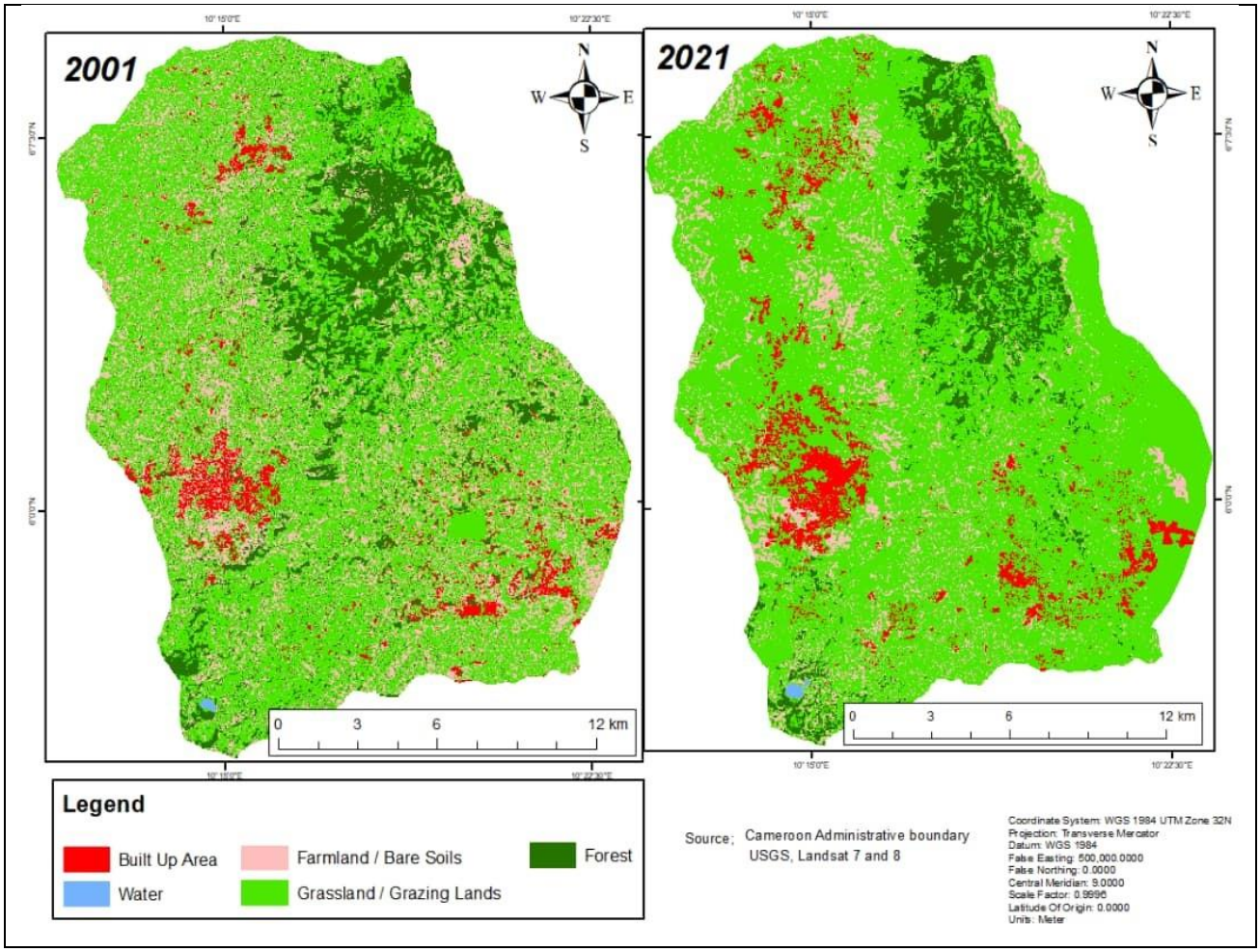

Map 2: (a) Land Use Situation in 2001 and 2021

Table 1: LULC Evolution for 2001 and 2021, Source: Derived from Land Use Maps of Tubah Sub-Division

Land use/cover category	Area in 2001 km^2	Area in 2020 km^2	Change in surface areas2001 -2020	% Change areas 2001 -2020
Built Up Area	15.25	21.23	5.98	1.53
Grassland / Grazing Area	219.92	265.69	45.77	11.77
Farmland / bare land	91.83	64.47	-27.36	-7.03
Forest Cover	61.44	37.01	-24.43	-6.28
Water body	0.31	0.34	0.03	0
Total	**388.75**	**388.75**	**0**	**0**

4.1.1 Farming

Traditionally, farming has always been (and stills remains) the main livelihood of the people in Tubah. Farming in Tubah Sub-Division is mostly rain-fed, where there is intercropping with food crops and fruits on the same farm. Main crops produce here include maize, beans, cocoyam, sweet potatoes and Irish potatoes while vegetables especially huckleberry is being cultivated along river channels and in valleys; this is rampant in Kedjom Ketinguh. In this case, the land use directly relates to the soil potential of the area. The area around home states is usually used for growing of food crops in order to sustain livelihoods. Farmers put together many types of crops on the same piece of land, which is a strong indication of conflict within the same piece of land. They also exploit any available small space between constructed areas. Farms in the rural areas generally range from 0.2 ha to 2 ha in size (13).

With the increase in population in Tubah, there has been increase demand for agricultural products. Therefore, to meet up with the increasing demand, the natural forests cover, rangelands and wetlands have been transformed into farmlands for the cultivation of crops, thereby, contributing greatly to land use conflicts in Tubah Sub-Division. Statistics of some major crops revealed that the surface area covered by farmlands have been increasing at the expense of forest, grazing lands and watersheds in order to increase outputs as illustrated in Table 1 and 2.

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Table 2: Area Coverage of Major Food Crops and Their Output, Source: Sub-Divisional Delegation of Agriculture, 2020

Crops	2017		2018		2019		2020	
	Area (Hectare)	Quantity (Tons)	Area (Hectare)	Quantity (Tons)	Area (Hectares)	Quantity (Tons)	Area (Hectare)	Quantity (Tons)
Maize	527	1370	577	1500	625	1812	665	1862
Plantain	21.5	174	22	174.5	29.5	251	30	262
Irish potato	92.2	2312	97.7	2432	107	2630	123	3075
Huckle Berry	31	465	31.8	477	38.7	580	43	645
Tomato	26	520	26.6	532	28	560	31	619

4.1.2 Grazing

This activity is dominated by the rearing of cattle which is chiefly in the hands of the Fulani. This land use practice is dominated by the Fulani's. It was only in the 1920's that the Pastoral Fulani entered the study area (14). The migratory movements of the nomads into this zone led to the introduction of new species of herbivores. Animal grazing is the second activity in terms of position in Tubah Sub-Division. Cattle rearing are predominantly carried out in Sabga as the principal site followed by Laide in Bambui, Ntah in Bambili and Kefem in Kedjom Keku which are widely covered with savanna. The land use maps of Tubah Sub-Division indicates that grazing land has witnessed a steady increase over the years. From field observation, Kedjom Keku habours the greatest number of cattle, as a result, graziers graze their herds indiscriminately. Grazing is reducing in Bambili due to the rapid growing population and rapid infrastructural development especially with the creation of the second Anglo-Saxon University of Bamenda (UBa) with an estimated student population of over 30,000. There is indeed a huge opportunity for infrastructural development in terms of low-cost housing, sport and leisure infrastructure among others.

This land use type can be term "extensive grazing system with transhumance" practiced by the Fulani people and is considered to be responsible for a wide range of vegetal and soil degradation. The Fulani's practice the system of transhumance, whereby the graziers usually move their cattle down the valleys during the dry season as a result of scarcity of natural pasture and water. Most land use conflicts such as farmer-grazier conflicts occur during this period as the cattle stray into farmlands and destroy crops. This goes against the law on transhumance which states that'' livestock farmers and their herds are expected in the hollow frontier between December and late March when the hills are dry''. But graziers move earlier than expected and due to the long time taken for crops like sweet potatoes, cocoyams, cassava to grow, livestock destroyed crops or the livestock farmers continue to stay in the transhumance area even after late March. These lapses between farmers aand livestock owners intensifies conflict.

Although grazing land has increased, there has been a steady decline in the number of cattle in Tubah Sub-Division as presented on (Figure 2). Interviewed respondents attributed these to weak governance and institutional lapses by authorities in handling recurrent farmers-graziers conflict leading to different agencies issuing conversions right to the same piece of land. this situation has intensified greed, the settling of scores among individuals, counter decisions and conflict of jurisdiction thereby intensifying conflict. As seen on Figure 2, the trend in the number of cattle in Tubah Sub-division has Significantly decrease to less than half its size from 39560 cattle in 2015 to only 1314 in 2020. This decline in the number of cattle could also be attributed to the current Anglophone crisis rocking the region.

Figure 2: Declining livestock trends in Tubah Sub-Division between 2014 and 2020
Source: SDDLFAI in Tubah, 2020

4.1.3 Forest Exploitation

The Tubah Upland Forest area is located in the Northern part of the Sub-Division, near the much larger Kilim-Ijim Forest and stretches from Bambui, Kedjom-Keku to Kedjom-Ketinguh. It is composed of three main ensembles: Alegafor (belonging to Bambui), Abong-Phen (belonging to Finge and Kedjom Ketinguh), and Keffem, including the patches surrounding Kedjom-Keku (Fintse, Kubuh, Mendong I, and Mendong II). The Tubah forest has a very rich biodiversity of plants and animals vital to support rural livelihood as well as protects the environment. The local population of Tubah Sub-Division depends on the forest resources for their local uses of forest and non-forest products to meet up with their basic necessities and for wealth creation.

Field work and land use-land cover maps of Tubah Sub-Division from 2001 to 2021 revealed that, the forest cover of Tubah Sub-Division has greatly been deforested for other land uses. This is in line with the work of Ndenecho (2003), in a study carried out in Tubah Upland Forest which revealed that the original vegetation of montane and sub-montane forest is fast disappearing due to land use practices such as subsistence farming and grazing resulting to land use conflict and degradation of the natural land cover. This is the case in Ndong-Efuh, Akwango, Kefem and Kwighe where farmers have slashed portions of the forest for the cultivation of crops or encroached upon by graziers, to meet up with the increasing demand for pasture. Consequently, different land users concentrate and compete in downslope

areas for diverse opportunities like fertile soil and pasture thereby bringing conflict.

4.1.4 Settlements

Settlement is today considered as the most important factor of land use dynamics in Tubah Sub-Division and has greatly transformed the area from an agricultural landscape to an urban one. Settlements here are not only limited to residential buildings but include all the structures and buildings found within the settlements, be it social, economic, administrative which are put in place to meet the needs of the population. Tubah Sub-Division host a considerable number of services such as the University of Bamenda (UBa), Technical School of Agricultural and Regional School of Agriculture, health units, health centers, administrative structures like the Sub-Divisional Delegation of territorial administration and decentralization, Sub-Divisional Delegation of Agriculture and Rural Development, Sub-Divisional Delegation of Fishing and Animal Husbandry, Delegation of Public Health, Delegation of Basic Education with a number of basic and secondary schools. All these structures are interspaced with commercial and non-formal activities without proper planning on the land use. The multiplicity of these institutions are clear indications that the urban centre is expanding rapidly which is a source of conflict (Figure 3). This indicates that as population increases, settlements and other infrastructural development also increase resulting to the emergence of new functions and an increase in the number of existing ones at the expense of other land uses. The area is made up of both urban and rural settlements. The study area is a junction town along the roads leading to Boyo and Ngokentugia Divisions; it is made up major urban centers like Bambili and Bambui. The urban settlements perform essential activities of secondary and tertiary sectors.

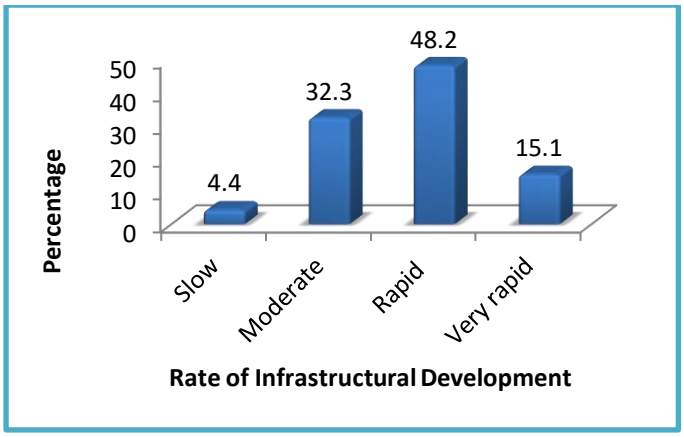

Figure 3: Respondents' views on the Pace of Infrastructural Development
Source: Field Work, 2021

Figure 3 illustrate the rapid rate of infrastructural development in Tubah Sub-Division. A significant majority 63.3% of the respondents agreed that the pace of development is very rapid and 32.3% noticed a moderate pace of development. It is important to note that the 4.4% of respondents, who saw the pace of development as being slow, were those in the interior villages in the Sub-Division. There is therefore a greater mixture of land use with residential, industrial, services and open space provision. The multiplicity of urban functions has resulted to conversion of the natural vegetal cover for settlements and developmental purposes.

4.2 Types and Manifestations of Land Use Conflicts in Tubah Sub-Division

This is a peculiar problem in Tubah Sub-Division due to the rapidly growing population and the need for individuals and institutions to meet their land use demands. These land uses are bound to conflict against each other if proper care is not taken. This usually results from the fact that people have different interest for land as a resource when these different interests meet over a particular piece of land, conflicts are bound to occur. The most outstanding of these conflicts is the farmer-grazier conflict. Other land use conflicts include: farmer-farmer, farmer-settlement, forest-farming and water catchment- farmer- graziers (Figure 4).

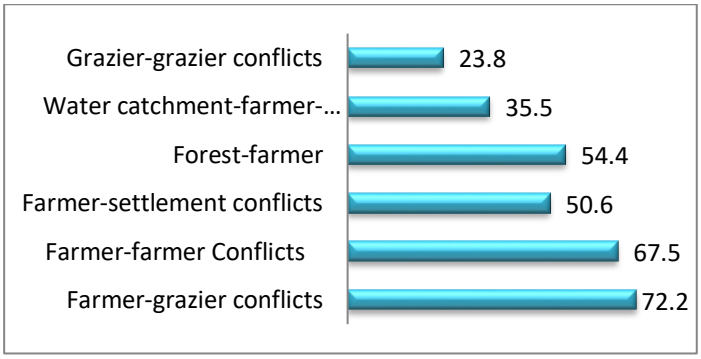

Figure 4: Respondents' Perceived views of Land Use Conflicts in Tubah Sub-Division
Source: Field Work, 2021

As seen on Figure 4, farmer-grazier conflicts are dominant and accounts for by 72.2% of the sampled respondents, followed by farmer-farmer conflict which account for 67,5%, forest-farmer with 54.6%, farmer-settlement with 50.6%, water catchment-farmer-grazier with 35.5% and lastly by grazier-grazier which account for 23.8% of the sampled respondents.

4.2.1 Farmer-Grazier Conflicts

Land use in Tubah-Sub-Division before the arrival of the Fulani people was dominated by subsistence farming and the harvesting of wild medicinal needs and hunting. But, with the coming of the Fulani pastoralist, concerns became very important, thus setting the pace for conflicting land uses. The arable lowlands in the area were occupied by farmers such as Lieh, Nteloh Meghe kusus,wada and kwigh while the hills such as kefem, Mbwangang, Abongphen, Sabga, Laide and Ntah were occupied by the Fulani graziers. Increase in population and change in climate couple with increase in demand for food has aggravated the conversion of grazing land into farmlands. This has brought about tension between the two groups. This problem is intensified during the dry season as the mountains become very dry; graziers move their cattle down the valley in search for

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pasture and water. This result to conflicts as the cattle end up destroying the dry season crops even though, the cow dung helps to fertilize the farms. The impact is mainly on the farmers who always loss their crops, since crops cannot destroy cattle. Areas prune to this conflict are in Ku, Mejang, Kefem, Kuwee in Kedjom Keku, Sabga and Chuku in Kedjom Ketinguh, Laide and Ntah in Bambili and in Finge and Ntambang in Bambui as both farmers and graziers occupy these areas and from time to time, they have conflicting interests.

These conflicts are manifested in different ways, at times through physical confrontations such as killing of Fulani cattle in Tubah Sub-Division By farmers, destruction of crops, destruction of fences (Table 4), convocations and court actions as illustrated in Figure 4.

Table 4: Annual Cost on Property Destruction and Localities in Tubah, Source: 15

Location	**Property Destroyed**	**Estimated Cost (Fcfa)**
Bambili	2 fences, intrusion in to grazing land, destruction of improved pasture land,	505000
Small Babanki	4farms,2fences,3houses on both sides	1000000
Big Babanki	18 boundary palm trees, destruction of pasture and a fence	800000
Bambui	4 fences, 2 improved pasture fields and crops destroyed	800000
Sabga	Destruction of property, spraying of chemicals over natural pastures, destruction crops, a fence and grazing land	900000

From cases registered in the Divisional delegation of Livestock (Table 5), it was reported that in 1995, there were destructions and burning of 191 farm houses by the Fulani herders and farms belonging to 244 farmers in Kefem in Kedom Keku (Divisional Delegation, 2015). During this period, many letters were written to the Divisional Delegate and the Governor about the occupation and destruction of crops and farmlands. This made individuals to mount pressure on their Fon to provide lasting solution which later on led to the resignation of the Fon in 2004 and later lynched in 2005 by his subjects for selling farmlands to graziers.

Table 5: Number of Farmer-Grazier Conflicts Registered, Source: Divisional office for Tubah 2020

Years	**Villages**				
	Bambili	**Bambui**	**K. Keku**	**K. Ketinguh**	**Total**
2014	1	/	/	2	3
2014	2	1	5	7	15
2016	6	5	17	9	37
2017	6	5	11	7	29
2018	2	1	2	3	8
2019	8	1	2	3	14
2020	5	3	2	6	16
Total	**30**	**16**	**39**	**37**	**122**

Table 5 indicates that 122 cases on Farmer-grazier conflicts have been registered in Tubah Sub-Division and the number of cases fluctuates in the different villages over the years with the highest number cases registered in Kedom Keku (39 cases). This is because the damages caused vary from one year to another. Most of the registered cases involve farmers invading grazing land, blocking of cattle tracks and drinking water points, cattle destroying crops and fences of farmers.

4.2.2 Farmer-Farmer Conflicts

Agriculture is the mainstay in Tubah Sub-Division and every one strives as much to own a farm as over 72% of the population are engaged in the activity. The farmer-farmer conflicts have become common and occur in all part of the Sub-Division. This arises from the fact that the farm boundaries are never clearly defined by the land administration and limited knowledge on spatial dynamics. Some farmers usually encroached onto neighbouring farmlands, unstructured land tenure systems and deviation of water paths by some farmers. This is why in the case of any sale of a piece of land; it must be signed in the Tubah Council with the presence of witnesses to avoid such problems. This conflict is predominant in market gardening areas like Ntah, Quier and Chuku. A case in point is the Bambili-Babanki war in 1991, where the cause of the war was because of encroachment by Bambili farmers into the fertile land in Babanki has led to loss of lives and massive destruction of property. Land tenure in this region like in other areas is culture specific. It is changing with the levels of social-economic and political realities of our time. Presently, it requires individual to present traditional items like kola nuts, wine and fowl to fon palace for a piece of lands. These altogether have resulted to recurrent conflict that is plaquing the study area with profound ramifications on human lives and livelihoods. 16 also noticed the implications of land tenure system on farmers livelihoods due to land conflict in the North West Region of Cameroon where he considered different types of land tenure arrangement to include rental, begged, purchase, gift and inherited lands. Interestingly, the situation about land demarcation for farming among individuals have become very complex as some successors have began asking back for the return of land given to their predecessors.

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4.2.3 Forest-Farming Conflicts

With the rapid population growth in Tubah Sub-Division, forest land is gradually being transformed to farm lands. In an effort to meet up with the increase demand for food, part of the forest has been transformed to farmland, grazing and settlements. The land use map of Tubah shows a steady decrease of forest land for farmland. Forest areas such as Alegafor, Abongphen and Kefem experience conflicting interest over the use their use. The conversion of forest into farmlands has resulted to biodiversity degradation, animal migration and extinction. As the forest is decreasing; it lives the soil bear and reduces the amount of infiltration which results to drop in water table. Like the case of Chuku watersheds where the conversion of the original forest for agriculture has led to reduction in freshwater quality and quantity and increase sedimentation in Kedjom Ketinguh water sources.

Plate 1(A) Conversion of Ndong-Efuh (Abongfen) Forest Edge for Huckleberry and Maize Production (B) Stream Siltation from Sediments due to exposure of soil from forest to agricultural practices in Finge
Source: Field Work, 2021

4.2.4 Farmer-Settlement Conflicts

Inhabitants of Tubah Sub-Division depend a great deal on farming as their source of livelihood. With this, small plots around settlements are used for farming. On the other hand, they cannot do without shelter, since shelter and food are among the most basic necessities; they strive for the same space. This situation is common in the Tubah urban space, where a piece of land is acquired, and is followed by the construction of a house and part is used for farming. As a result of increasing population, these farms around the houses have become very small to sustain the family. With this pressure, residents tend to expand their farms which sometimes lack land demarcations from the Ministry of land tenure and survey. Thus, conflicts between farming and settlement land uses are prone to take place. This is a very common phenomenon in the Bambui residential area amidst rapid population increase, urbanization and infrastructural development such as the building of hostels in the student residential areas. The rapid increase in population is a function of both natural increase and migration with an annual growth rate of 3.0, the 2005 General Housing Census and Population Census recorded over 93945 inhabitants which has increase the level of farmers settlement conflict. 17; 18 identified population pressure on land as a source of conflict in urban and semi-urban areas of Cameroon.

4.2.5 Farmer-Grazier Conflicts around Watershed

Despite the important of water and the need to ensure water management for sustainable development, watersheds are zones of conflicts because land users of public resources express and defend different interest (19; 20). There are different interests between upstream and downstream inhabitants with the former not always having direct benefits like better water quality, supplies and access to irrigation. The watershed areas have rich forest cover, thus making the area a potential source of natural resource whereby farmers and Fulani grazers are interested in. Due to the fertile land around the catchments, agricultural production is a viable alternative all year round. Thus, the inhabitants frequently intrude into the watersheds to farm since the outputs are very high (Plate 2A). Farming around water catchment result to water shortage and reduce the quality of the water as these farmers also apply fertilizers which reduce water quality. Also, some farmers practice irrigation cropping using the potable water without paying any extra fee, which result to reduction in water quality and quantity (Plate 2B).

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Plate 2 (A) Maize and Plantain Cultivation around Water Catchment in Kedjom Keku (B) Irrigation Farming around Water Catchment using Fertilizers
Source: Field Work, 2021

This is in line with a study by 21 on conflicting land uses in Tubah watersheds, with main objective to provide water to the community downstream has been exploited by farmers and graziers. The study was based on land use dynamics in five watersheds in Tubah Sub-Division. From results presented in table 6, it revealed that the indigenous forest of the watershed areas of Bambili and Tchabal Keku, have been completely destroyed for subsistence farming and grazing with very little or no fallow periods, while that of Bafunge and Tchaba Bamessing are in the verge of degradation as a result of incompatible land uses. This has resulted to increase runoff, accelerated soil erosion and sedimentation downstream which have resulted to reduction in water quality and quantity. This shows that the changing land use patterns in the watersheds which are incompatible have resulted to conflicts of interest reducing quality and quantity of water downstream.

Table 6: Conflicting land uses in the Tubah Watershed Source: Adapted and Modified from 21

Watershed areas	Areas in Hectares (ha)	Indigenous forest (ha)	Subsistence agric (ha)	Grazing land (ha)	Bushland/Fallow (ha)
Bambui upland	750	200/26%	100/13.3%	250/33.3	200/26%
Bafunge Upland	1400	240/17%	200/14.2	960/68.5	???
Bambili	600	None left	396/66.6%	204/333	None
Tchabal Bamessing	770	60/7.7	10/0.1%	600 /77.9	???
Tchabal keku	430	None left	250/58%	180/14.8%	???

Also, from interviews with some elders in Chuku, it revealed that in 1980 the Chuku watershed was forested, but due to conversion into agricultural land coupled with rapid deforestation and planting of eucalyptus trees. The amount of infiltration and percolation into the underground water reduced drastically eventually leading to the complete drying up of the stream.

4.2.6 Grazier-Grazier Conflicts

This conflict is restricted to the Eastern part of the Sub-Division. This is because of the presence of a common grazing land in the Sub-Division use by grazers from the four villages. Grazier-grazier conflict has led to massive displacement of livestock population in Tubah Sub-Division. Competition on land is often accompanied by antagonism resulting in the "tragedy of the commons". From data collected from the Divisional Delegation of Livestock (2015), so many cases especially in Kedjom Keku were registered and with gross antagonism as a result of the introduction of large-scale ranch. A case in point in Kedjom Keku was in 1989 when Aladji Baba Danpollu of Ndawara carved out a large portion of the Kefem hill for grazing where about 20% of the indigenous population depended on for their survival. This resulted to stiff conflict which resulted in the destruction of pasture land and property. For the sake of peace, and because they could not fight with the highly influential Aladji Danpollu many graziers left the area. This shows that the land tenure system in Tubah Sub-Division is discriminatory against the marginalized population (low-income households, women and children). 22 corroborate these views as he opines that most at time, the claimers of land ownership are either political elites, men folks or rich influential individuals who at times are absentees. As a consequence, vast hecters of land are under-utilized under the watchful eyes of the administration. This retard social progress and economic development of communities leading to emigration and cycle of poverty.

V. CONCLUSIONS AND POLICY OPTIONS FOR LAND CONFLICT RESOLUTIONS

This study reveals that the population of Tubah Sub-Division depends largely on land for its survival and development. This has resulted in changes in the use of land over time and space which are necessary and essential for economic development and social progress. Ironically, land is under intense pressure from population increase, changing climate and poor management. These have generated multiple land use conflicts that have rocked the area for a very long time. The land use types in Tubah Sub-Division tend to conflict against each other. Where these conflicts occur, power, wealth and survival are measured by ownership and control of land as a vital need for sustenance. Conflicting land uses arise from the fact that land has multiple uses which range from agriculture, a major user of land resources to settlement usually the most pressing need for living space for the growing population. This type of conflicts in Tubah Sub-Division include; farmer-farmer conflicts, grazier-grazier conflicts, Forest-farmer conflicts, farmer-settlement conflicts with the main land use conflict being the farmer-grazier conflict. These conflicts have had tremendous consequences ranging from destruction of farmlands, killing of cattle, environmental degradation amongst others due to their manifestation over rime and space. As a policy options, the study recommends among the following.

Stakeholders and land planners should adopt land use planning measures to achieve optimal balance between competing interest, multiple land user and the use of un-ideal land. Through proper education, sensitization and control measures, land use practices such as the negative impacts of extensive range grazing, the adoption of paddocking and zero grazing could be minimized. Also, the farmers should make adequate use of soil improvement techniques so as to adopt intensive agriculture that could limit their land's thirsty tendencies. Pastoralist organizations can facilitate the inclusion of herders' concerns and needs in discussion in their assembly or as focus messages during their prayer days for conflict management. Land use conflicts in Tubah Sub-Division can also be prevented through the provision of subsidies and fertilizers to conflict driven villages and individuals by government. This will help the people to improve on their farms and limit their desires to have more farmlands which they think sustains them. Land conflicts in Tubah Sub-Divisions can be managed through the enforcement of property right. Through the clear demarcation of the different land use and defaulters of such laws be brought to book. A common synergy should be developed between all the stakeholders where community participation and action could be integrated which involve training of actors, site appraisal, allocation of land for water catchment protection and live fence by planting environmentally friendly tree species those that can be used for watershed protection. Also, the community should be sensitized on the importance of watershed and water catchment protection through the use of the indigenous forest, agro-forestry, contour ploughing, pasture improvement and the establishment of woodlots. Indeed, participatory approach as could be seen as collaborative and problem-solving approach process which recognizes the people's right and responsibility to manage their own affairs.

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