Combating Land Grabbing and Empowering Local Communities through Participatory Mapping in the Upper Balong Clan, Cameroon

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Abstract
Most Cameroonian local communities endure severe land grabbing and boundary misapprehension due to ignorance and inadequate documentation from local authorities and the State. It is in furtherance to these drawbacks that, this paper seeks to introduce remedial solutions through land use plans from participatory mapping. Data collection was done through facilitators from the villages of the Upper Balong Clan. It was used in the elaboration of the land use plan scenario which led to the realization of the land use map. The Landsat7-2016 satellite image was used to visualize the land cover and estimate the percentages of breakdown of different land use types in the community. Results from findings divulge that six land use types within the Upper Balong community from the land cover statistics were identified. The surface area planning was produced with a 37.44% crop land extension. The general community land use planning map for the upper Balong Clan was realized by combining the maps from each of the eight villages. Participatory mapping is therefore recommended in other local communities so as to reduce land gabbing and tenure conflicts.

Key words: land grabbing, land use maps, participatory mapping, local communities, Upper Balong Clan.

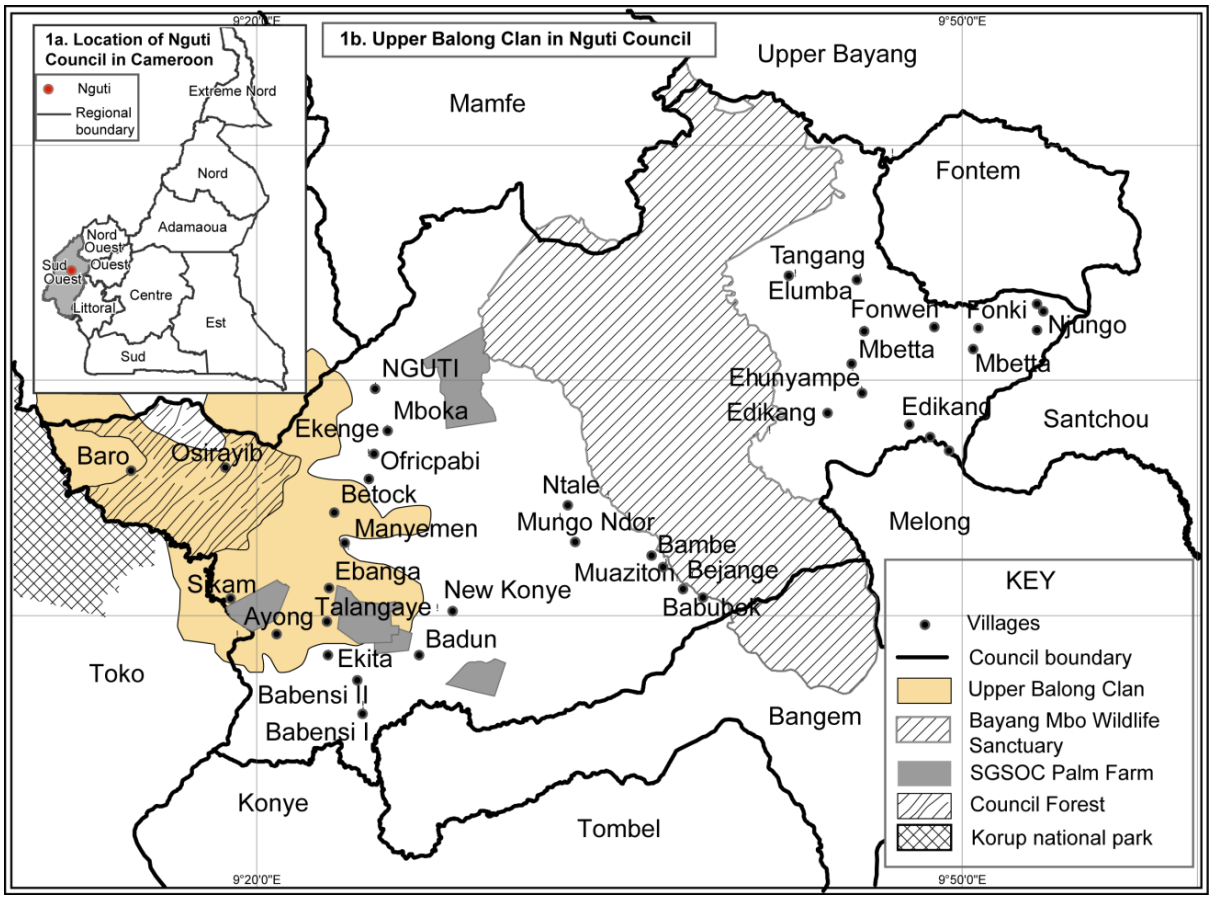
1.0: Introduction
Participatory mapping is the bottom-top approach that enables communities to create maps for all that will benefit the local population either directly or indirectly (Haklay, 2013). Participatory research is often used in order to confront the marginalization and social exclusion of groups such as villages or local communities. Community empowerment on land information nowadays is an objective of community-based participatory mapping. It is recognized by Civil Society Organizations as the key communication tool for communities and decision makers. Forest communities have been suffering from non-participative allocation of forest concession, mining and conservation for some time now. Most of these forest allocations are conflicting with communities' livelihood activities. The majority of Communities in Cameroon are still rural in character despite growing urbanization. Secured and increased access to land and natural resources for them is a key means of achieving food security and broadening the economic opportunities available (Nguti Council, 2016). There is growing need, therefore, for the local communities to be empowered to own, control and have access to land so as to improve on their well being.

Land use planning in Cameroon is primarily administered through the Ministry of Economy Planning and Regional Development (MINEPAT) as part of a decentralization process that is gaining ground in the country, and other areas in the Congo Basin. Community

involvement in decision-making is becoming increasingly imperative, especially with regards to the management of land and resources. The aim is to contribute to poverty reduction, sustainable management and improved governance of tropical rainforests Communities through a community based methodology for land use planning made by Civil Society Organizations (Chambers, 2006). All land is owned by the government in Cameroon who only takes decisions on allocation in order to avoid or prevent conflicts, as well as allow communities to be part of the decision making process concerning their lands and resources.

Unfortunately, the local community of the Upper Balong clan finds it difficult to own land due to severe land grabbing and boundary misapprehension emanating from inadequate documentation from local authorities and the State. The presence of the Nkwende Hills Forest Reserve and conservation organizations further increases the propensity to land conflicts between the local people and the companies. This article therefore seeks to bring out curbing strategies as solutions to such land grabbing through participatory mapping, so as to empower the local communities and give them a chance in decision making.

Located in the South West Region of Cameroon, the Upper Balong clan is one of the nine clans that make up the Nguti Subdivision. It is boarded in the North by the Bebum Clan and Eyumujock Subdivision, in the East and the South by the Bassosi Clan, and in the West by the Kurup National Park in Toko Subdivision (Figure 1).



Source: Adapted from CGF project for Nguti Council (2014-2016)

Figure 1: Location of the Upper Balong Clan

This clan covers a surface area of about 40988ha, with eight villages (Betock, Ebanga,Talangaye, Baro, Ayong, Osirayib, Manyemen and Sikam) which are headed by local chiefs.

2.0: Methodology

The realization of community land use planning in the Upper Balong Clan was done through the acquisition of baseline data. First of which was the Landsat7-2016 satellite image, used to visualize the land cover, and to estimate the percentages of breakdown of different land use types in the community. Secondly, a soil map was used to identify the different soil types and their fertility rates. It was beneficial in guiding the community during planning on the appropriate area to locate their farms and other activities. Furthermore, the rainfall statistics from the Ekona Research Centre (IRAD), were used to guide the community on the rainfall situation (period and density), and the amount of water available in the soil that could facilitate farming activities. The Upper Balong Clan topographic map was then used to identify the nature of the terrain in terms of mountainous, steep slopes, valley and plains with the hope to determine the suitable type of activities to be carried in such areas.

Eight steps were realized in the community land use planning process of the Upper Balong Clan. The whole process began with an identification and information phase, which led to the detailed explanation of the benefits of participatory mapping to the local communities. Upon approval, the community engagements were done where in, the administrative authorities, local chiefs, elites and other stakeholders accepted to facilitate the process. With an engagement taken, a community land use planning structure was then established with a selection of community planners. The functions of these planners was to collect and assist in the compilation of data as well as serve as contact persons on land use planning matters in the communities. The community planners which were fifteen in number were trained on how to administer questionnaires in households, collect GPS points and household locations as well as major features such as roads and other built-up space.

Data collection was done by community trained planners and facilitators who collected household data such as farm sizes and crop production levels, prices of produce, population density, type of activities carried out, as well as distances covered to receive social services. Further data was collected on the GPS points of each household and information on small holders, key informant data and focus group data. Later on, the data collected by the community planners and the facilitators was analysed using the Microsoft excel spreadsheet and an ArcGIS software. The different scenarios and possible land use options identified in the data collection phase were represented in a map form and approved by the entire Upper Balong clan.

In the scenario development process, land cover analysis was used to identify all land use types. Through this process, all the State concessions were removed and only the community activity land was left. This was done in other to prevent the community from planning on State-owned land and concessions. Also, each land use map and the statistics of each type were presented. A grid square of 100 cells representing community total surface area (100%), in which one of the grid cells represented 1% of total area. It was occupied by the community and each percentage represented a quantity on the land use types which is termed the initial situation of land use system was used. This planning was done by the community and all data was analysed to produce concrete results.=

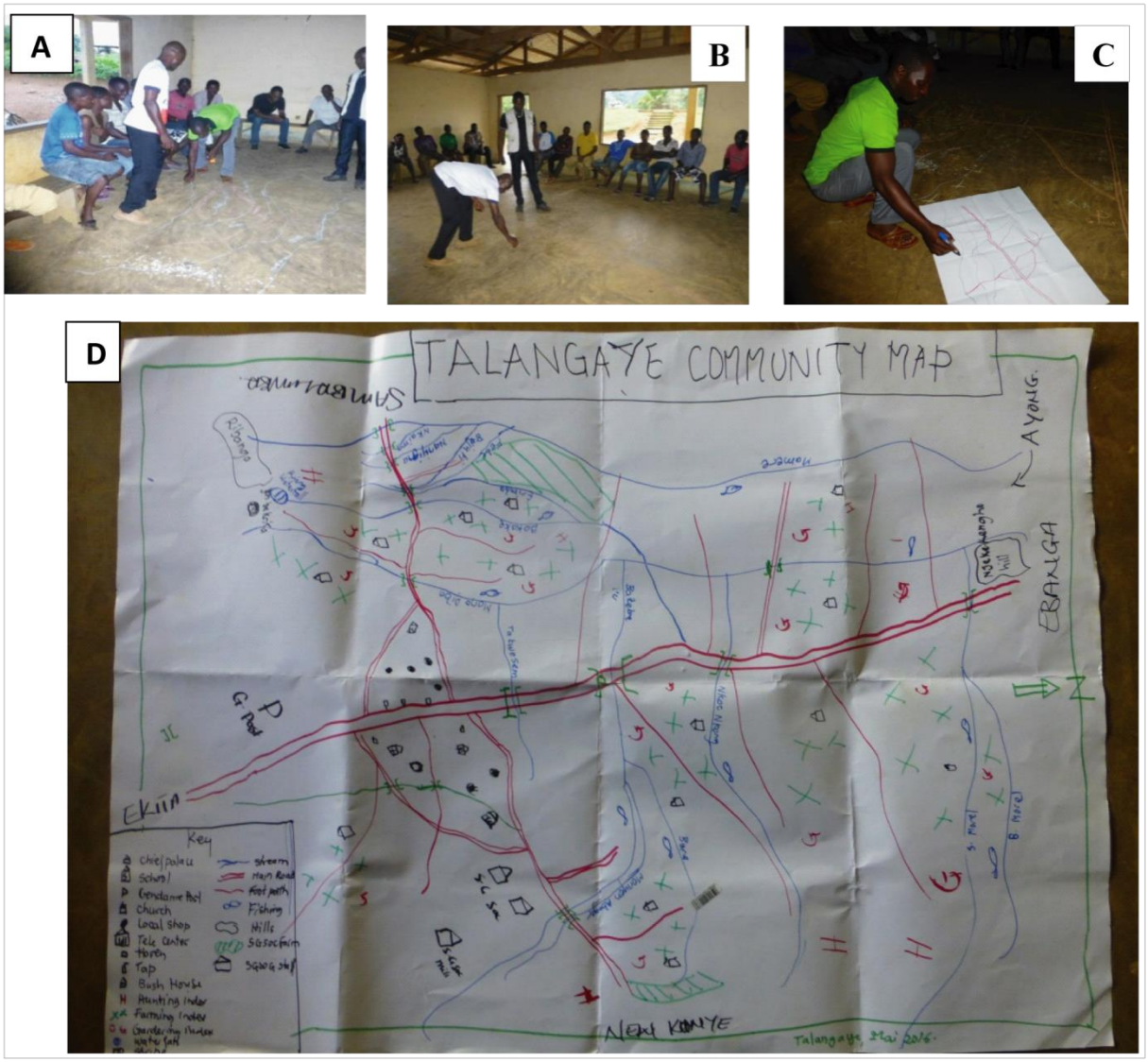
3.0: Results, Analyses and Discussion

Results from findings propound that several steps were carried out in the process of establishing a community-based land use plan in the Upper Balong Clan. It started from the production of a ground map, to the elaboration of the distance map, which ended with the development of scenarios.

3.1: The production of the Upper Balong Clan Ground Map

The ground map is the draft of a land use map drawn to facilitate the acquisition of data on the field (Al-Kodmany, 2002). It is made up of information which is needed to realize a land use plan of an area. Upon presentation of the importance of participatory mapping and the role of the community in the establishment of a land use plan, the Upper Balong Clan community was therefore set for a land use map realization. In order to produce the land use map of the set area, an introduction of the ground mapping was done. During the elaboration of ground map, community activities, infrastructures and resources were identified and the main road through the village was materialized.

The process of ground map realization begins with the primary production of the ground plan as seen in photos A and B. Through important exchanges between the facilitators and the local community trained cartographers, the ground plan is transformed into an initial map on a cardboard paper as seen in photo C. Other imperative items such as the orientation, scale and key which were absent were included on the ground map for initial stage approval in photo D. The ground map production saw the participation of the entire community. This facilitated the identification of activities, infrastructures and resources which were included on the ground map and a key produced to define all symbols identified and used (Figure 2).



Source: Field work, 2018

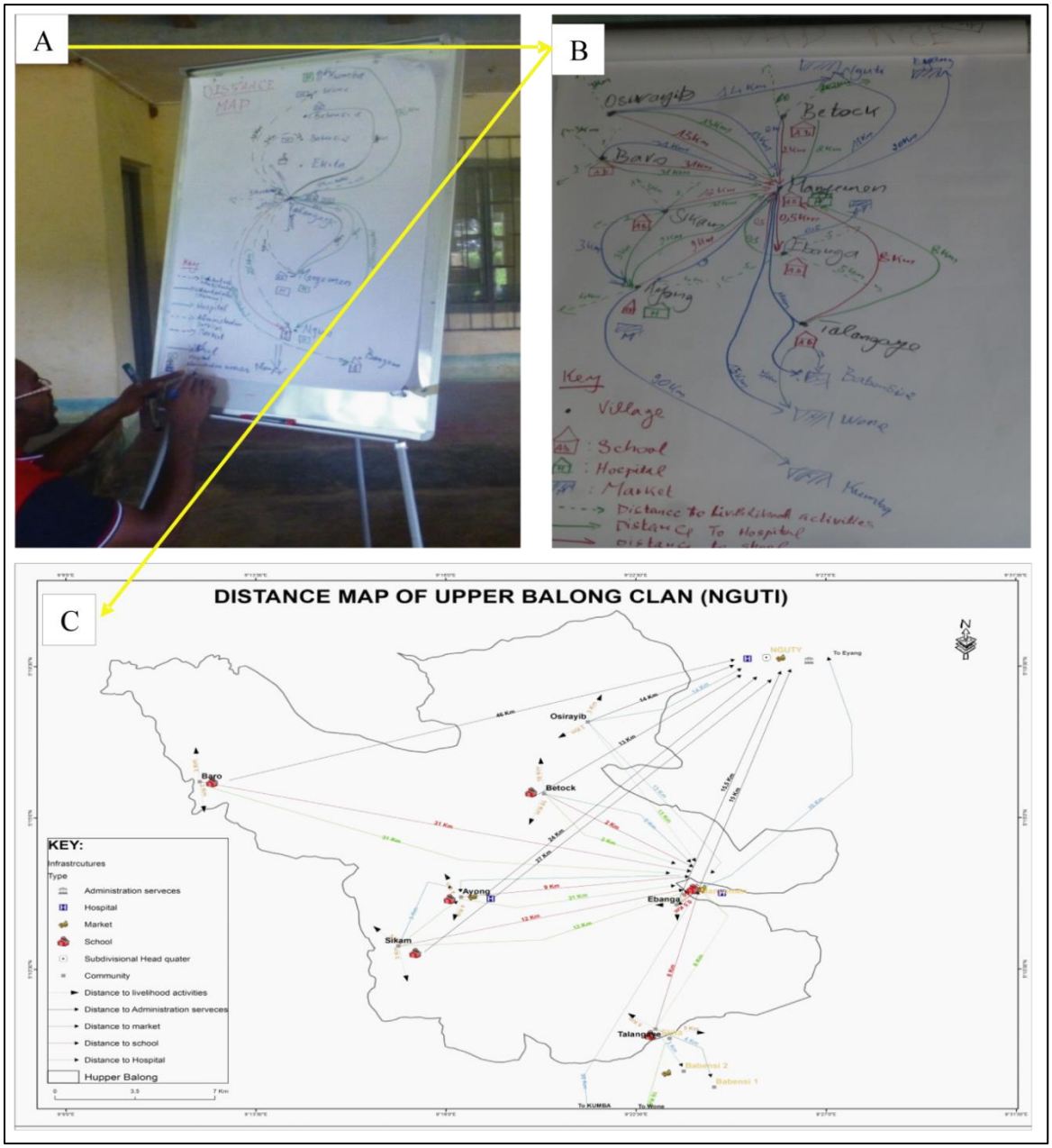
Figure 2: The Ground Map Realization Scenario in the Upper Balong Clan

Since the production of the ground map is a gateway to data acquisition and confirmation with the hope to treat and realize a land use map, facilitators and community cartographers had to go back to the field to confirm the introduced data on the ground map. This was aimed at facilitating the calculation of distances and exact GPS points.

3.2: The Establishment of the Upper Balong Clan Distnace Map

A distance map is a sketch used to determine the various kilometers covered by the community members of an area from one activity to the other (Kathlene, 20007). In order to estimate and reproduce the various distances covered by the farmers of the Upper Balong Clan community and the cost-effect advantage, it was therefore necessary to establish a distance map of the area. The elaboration of the distance map began with the acquisition of information from the data collectors from the field onto the paper as seen in photo A. Several calculations and extrapolations were done so as to represent the appropriate distance on the ground on paper. The

results gotten were then represented on the sketch as seen in photo B. Having completed some other items through discussions from the facilitators and the local community cartographers, the distance map was then produced in photo C. The distance map was used to determine the various distances covered in order to carry out activities such as subsistence farming, accessibility to social amenities, availability of infrastructural and administrative services. The distance map showed that people living in communities like Baro, Sikam, Ayong and Talangaye cover very long distances (about 15 km to 46km) in order to access health services, markets, schools and administrative services (Figure 3).



Source: Field work, 2018

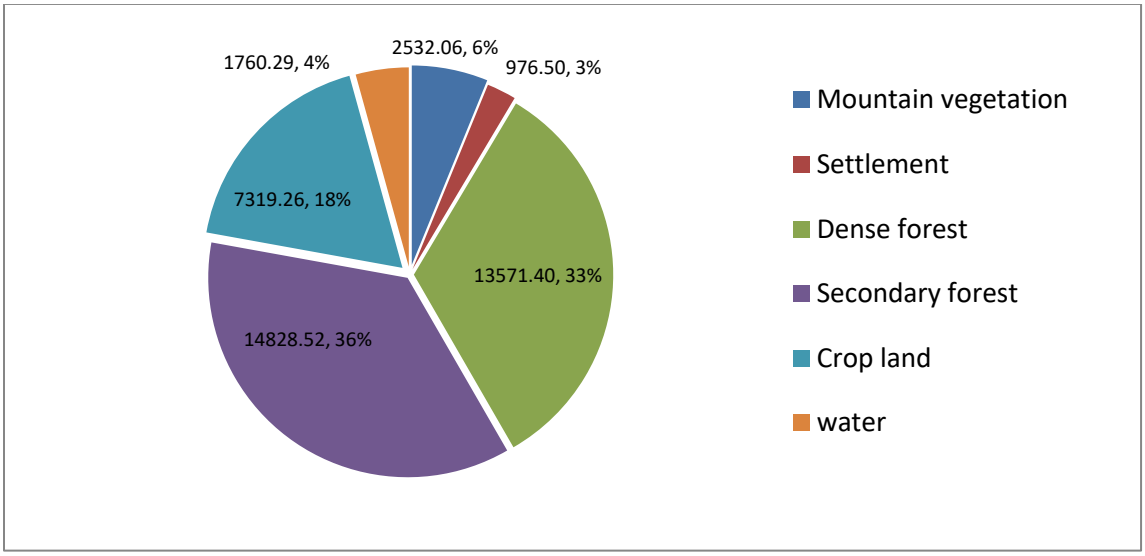
Figure 3: The Upper Balong Clan Distance Map

This explains the reason for increasing mortality rate, high cost of living and illiteracy within these communities. A combination of the ground and distance maps facilitated the introduction of scenarios to finalize the land use map of the area.

3.3: Scenario Development and Land Use Map Production in the Upper Balong Clan

Scenario development deals with the steps taken to realize a community land use planning map (Temgoua and Ajangson, 2013). It goes through several stages and assumptions which lead to the pre-test and confirmation of an appropriate one to execute. In the Upper Balong Clan, scenario development was used in the production of the land use map. In order to carry out land use planning scenario, land cover data was used. Land cover data is first hand data through satellite images used to develop scenario planning (Pain, 2014). The Landsat 7-2016 was used to develop land use planning scenario in the Upper Balong Clan. It showed the different land cover types which were later transformed into land use types for execution in the map.

From the land cover statistics, the participants and facilitators were able to identify the different land use types of the clan which range from settlement or built-up areas, crop land, dense forests, secondary forests, mountainous vegetation, as well as water. The land cover percentages of the clan were calculated to confirm their sizes on the land use map (Figure 4).



Source: Landsat satellite image (p187r57) and participative maps of Upper Balong, 2015)

Figure 4: Land Cover Percentages in the Upper Balong Clan

The land cover percentages results show that the secondary forest constitutes more than 75% of the surface area of the clan. These percentages of breakdown of the different land use types were calculated with the help of satellite imagery in order to obtain appropriate results. Scenario development was based on some three assumptions. It was assumed that, the population of the Upper Balong clan will increase while the available space remains the same, or that all the plan needs will experience an increase in 5%, and also that, a 10% increase land might be used by the government in the course of the planning. These scenario developments led to the identification and breakdown of varied land use plans for each village community of the clan (Table 1).

Table 1: **Land use Planning per Community in the Upper Balong Clan**

Villages	Land zoning
Osirayib	- Farm land extension
	- Settlement extension
	- Reserved land
	- Community land
	- Reserved for private investors
	- Part of present community land is not accessible because of high relief which is about 20% of community land. - The communities want to transfer the 20% to the level land available in the lower part of Kwende hills so that, the other inaccessible area should replace the former community land
Sikam	- Community fish pond
	- Reserved land for future generation
	- Farm land extension
	- Settlement extension
Ayong	- Touristic site
	- Timber exploitation
	- Community fish pond
	- Future mining zone
	- Cultural site
	- Community plantation
	- Agro-forestry zone
	- Market
	- Reserved land for future generation
	- Farm land extension
	- Settlement extension
Baro	- Infrastructure (school, Kurup house, Guest house, Community hall, forest post)
	- Reserved land for future generation
	- Farm land extension
	- Settlement extension
	- Private palm and rubber farm
	- The council forest should not be touched
	- Part of FMU 11001 will became community land after the exploitation
Betock	- Increase farming within the village
	- Land reserved for Agro-forestry project
	- Village small holder palm farm to produce palms supplied SG SOC
	- Infrastructure (community hall, Proposed University)
	- Settlement extension within the main road
Ebanga	- Reserve forest for gathering
	- Increase settlement
	- Area for secondary school

	- Area for farming extension
	They want to extent their farmland to SG SOC Farm. The community forest will be the area where they will carry out gathering and small scale agriculture.
Talangaye	- The part of proposed FMU 11007 (1193ha) will be used for Talangaye Community forest. - It will merge with the other villages to form large community forest for the benefit of the community in compensation of the large quantity of their land (2500 ha) that the government has given to SG SOC. - It will also help to preserve the main source of water for the village and will constitute a good refuge for animals.
	- For the community land, part will be used for Agro-forestry (450ha)
	- Experimental field for agriculture for the University of Buea (200 ha)
	- Mukete Estate Ranch for animal rearing and meat market (100 ha)
	- Talangaye Palm Cooperative Farm (259 ha) which will be supported by SG SOC
	- Industrial area

Source: Field work, 2018

The detailed identification of land use planning done at the level of individual villages of the Upper Balong Clan facilitated the scenario tests of the area. The three assumptions were experimented to determine which one was most suitable to be adopted. It further led to the breakdown of surface area planning, with various units set for the exercise. The planning by community members were done in such a way that each project was allocated in the map in the form of a polygon and the land use types identified by the planners were given portions in the total size of the communities' customary land (Table 2).

Table 2: Surface area planning in the Upper Balong Clan

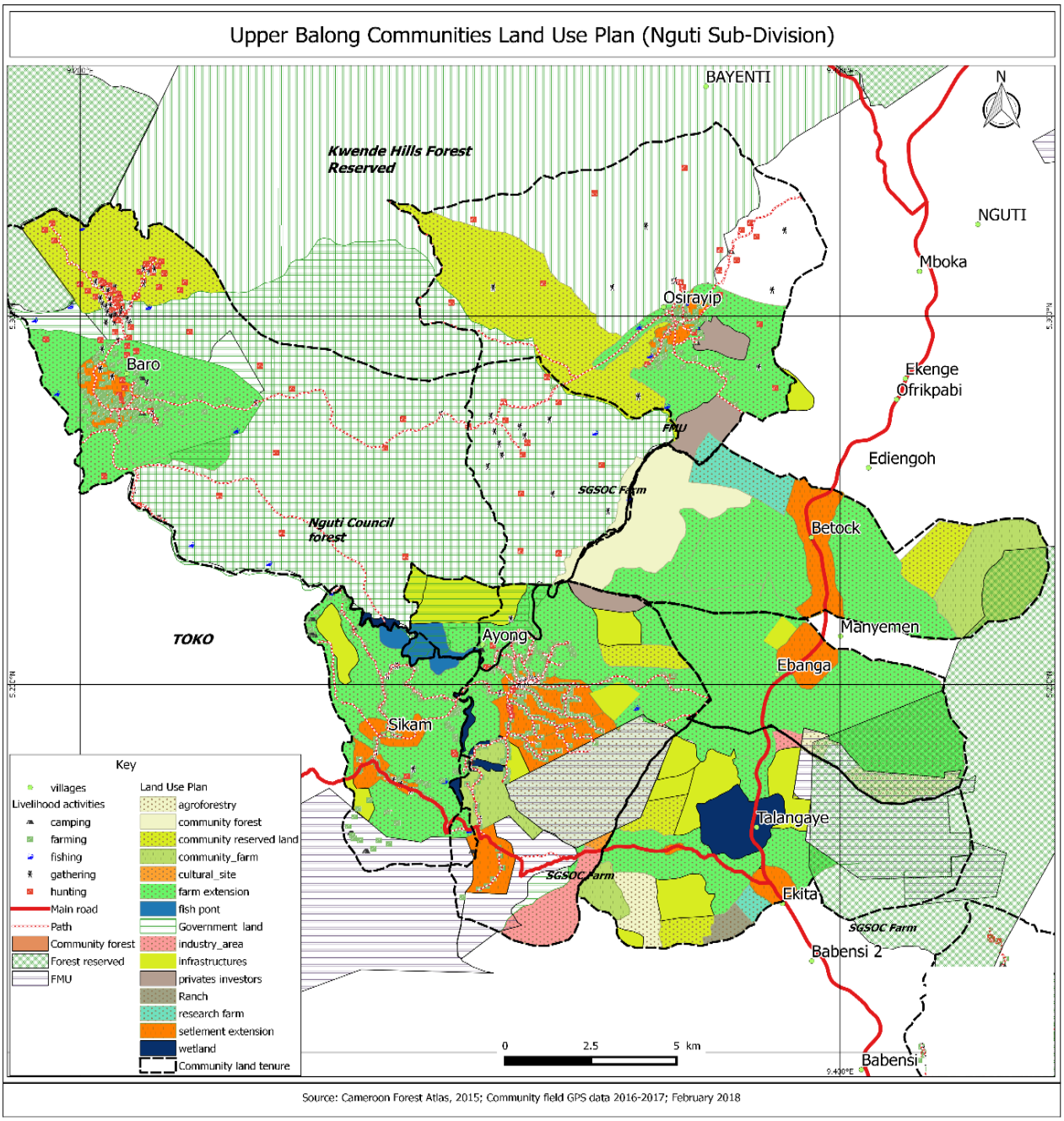
Areas set in the Planning	**Surface area (ha)**	**Percentages**
Agro-forestry	764	2.21
Community forest	1193	3.45
Community plantation	6000	17.33
Crop land extension	12959	37.44
Cultural site	979	2.83
Fish ponds	226	0.65
Industrial site	382	1.10
Infrastructure	156	0.45
Land for investors	820	2.37
Ranch for animals	90	0.26
Research land for University	387	1.12
Community reserved forests	4317	12.47
Settlement site	2287	6.61
Touristic site	520	1.50
State property	3534	10.21
Total	34614	100

Source: Planning by Upper Balong Communities, 2018

The surface area planning showed that 37.44% of the village space was to be allocated to crop land extension in the Upper Balong Clan local community. In this way, the people will be empowered and will be self-reliant. Also, this surface area planning facilitated the scenario development process. The third scenario was adopted because it showed an integrated planning for all the villages in the Upper Balong Clan. The dense forest was 2%, the secondary forest dropped from 34% to 11%, where 8% was allocated to agro forestry, 2% to the built-up area, 3% for small holder farming, as well as 7% for the industrial zone. Associating the land use planning of the villages (Table 1), to the surface area planning (Table 2), the Upper Balong Clan community land use plan was then produced.

3.4: The Production of the Upper Balong Clan Community Land Use Plan

The community map of the Upper Balong Clan was produced from the adoption of the third scenario. It was obtained from combining the eight villages of the clan, which enabled them to have the community land use map. The combination was done per land use type and superimposed on the clan tenure map, as well as the various State lands allocation organs in the area. Planning form the various villages that make up the clan was used and it was environmentally sustainable with identifications of various land occupations and the allocations of reserved zones. The planning was done according to the soil types in order to orientate farmers during crop production, the topography and water shade, so as to avoid the destruction of water vegetation along streams and river banks for agricultural purposes. A portion of the dense and secondary forests were not exploited for climatic reasons in order to contribute in the reduction of the impact of deforestation. Having taken all these into consideration, the land use plan of the Upper Balong Clan was produced. Strategic directions, which entail rules to guide the strict respect of the land use plan, were later on drawn by the community's traditional authorities and the State administrators, in order to guide the use of each land use type. In this way, the land use map will be put into use and conflicts be reduced at best (Figure 5).



Source: Community Field GPS data, 2016-2017, Cameroon Forest Atlas, 2018, Field work, 2018

Figure 5: The General Community Land Use Planning for the Upper Balong Clan

4.0: Conclusion

This paper was aimed at showing that, local communities can be empowered and has the right to land ownership through participatory management. Using the local communities to create land use maps and produce land use plans stands as one of the suitable methods to fight land grabbing and land conflicts in Cameroon. Community land use planning can be a powerful tool for capacity building, empowerment and conflict resolution, when communities are fully participative in the process of decisions that concern their wellbeing (Craig et al, 2002). In the

Upper Balong Clan, the local community was fully engaged in the realization of their land use plan as a means of empowering the population and providing them with improved standards of living.

With the local community fully involved in the data collection right up to the realization of the land use map of the area which saw an increase in the crop land of the inhabitants, the administrative authorities, traditional rulers and local community members breathed a sigh of relief. This paper generally observed that participatory mapping was highly appreciated by the Upper Balong Clan local community as several land conflicts were resolved. Participatory mapping therefore stands as a major tool in curbing land grabbing and tenure conflicts. The paper hereby suggests that, participatory mapping be introduced in all other local communities in Cameroon and beyond in order to salvage the problem of land grabbing and tenure conflicts.

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