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History of economic development and forest land-use in the Fako-Meme forest region of Cameroon

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Abstract. The article is devoted to investigating a number of issues within the forest landscape of the Fako-Meme, south west region of Cameroon. An assessment of the history of economic development and use of forest in the studied territory was carried out. It was observed that the rate at which these forests are being hewn down for various purposes

under the pretext of development leaves much to be desired. The deforestation of the forest with the attendant problems of resource degradation, environmental mutation is a cause for alarm. In order to understand the mutations taking place in the forest landscape, the history of forest use in 4 different periods: 1) the pre-colonial era (before the arrival of European explorers), (2) German colonial rule (1884-1916), (3) British colonial rule (1916-1961) and (4) Independence and post Independence Cameroon (1961-present day). It was observed that during the pre-colonial era the forest landscapes were very stable. Forest degradation in the territory started with the introduction of extensive mechanized agriculture introduced by the colonial masters through the opening of large agro-industrial plantations of rubber, palms and bananas. This forest ecological region suffers from a number of challenges. These problems were investigated in detail with proposals made for the sustainable management of forest resources in this forest ecosystem situated in the heart of the humid tropical region of the South West of Cameroon. These forests provide for a wide range of human needs ; medicine, timber , fuel wood, non- timber forest products (NTFPs), food crop production and cash crop cultivation. The pattern of land-use change in the Fako-Meme region was studied in three distinctive periods (1978, 2000 and 2015). The results revealed that anthropogenic activities have been systematically raping the forest landscapes so that the environments are only a skeleton or shadow of their former selves. This is an ecological region in which forest gives way to farmlands and plantations. In this respect, we see that what was a forest landscape in the past is now consisting of a succession of cocoa farms, palm, rubber as well as other economic cash crop plantations, with cocoa being the most important cash crop in the region. Evidence from our analysis reveals that this region has lost 42% of its forest cover within the period 1978-2015. This dynamic can be considered catastrophic. If this trend continues uninterruptedly in the region, then in 60-70 years, the Fako-Meme and the slopes of Mount Cameroon will remain without forest. It is easy to imagine the consequences of this. The study calls for urgent adaptive environmental strategies for the sustainable management of forest and its resources in the region.

Key words: History, economic development, forest land use, deforestation, Fako-Meme region, Cameroon

Історія господарського розвитку та лісовикористання у лісовому регіоні Фако-Меме, Камерун

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Анотація. Стаття присвячена дослідженню ряду проблем лісових ландшафтів Фако-Меме, південно-західного регіону Камеруну. Проведено оцінку історії господарського розвитку та використання лісів в районі дослідження. На основі аналізу було виявлено, що швидкість з якою вирубують ліси для різних цілей під приводом розвитку, залишає бажати кращого. Вирубка лісу призводить до деградації природних ресурсів, мутації навколишнього середовища. Для того, щоб краще зрозуміти, які зміни відбулися у лісовому ландшафті ми виокремили періоди освоєння та використання лісів Фако-Меме: 1) використання лісу у доколоніальну епоху (до прибуття європейських дослідників); 2) німецьке колоніальне правління (1884-1916 рр.); 3) британське колоніальне правління (1916-1961 рр.); 4) незалежний Камерун і до нині. Встановлено, що в доколоніальну епоху лісові ландшафти були дуже стабільними. Деградація лісів на території почалася з впровадженням великого механізованого землеробства, введеного колоніальними господарями за допомогою відкриття великих агропромислових плантацій каучуку, пальм і бананів. Разом з цим лісовий природний регіон зіштовхнувся з низкою проблем. Ці проблеми були детально вивчені з пропозиціями, щодо сталого управління природними ресурсами в лісовій екосистемі, яка розташована в центрі вологого

тропічного регіону на південному заході Камеруну. Ці ліси забезпечують потреби людей, починаючи від медицини, деревини, паливних ресурсів, недеревних лісових товарів (НДЛТ), виробництва продовольчих культур і вирощування товарних культур. Характер змін землекористування в регіоні Фако-Меме вивчався на прикладі трьох відмінних періодів (1978, 2000 і 2015 роки). Результати показали, що антропогенна діяльність систематично знищує лісові ландшафти. Фако-Меме – це природний регіон, в якому ліс поступається місцем сільськогосподарським угіддям та плантаціям. У цьому відношенні ми спостерігаємо, що в минулому лісовий ландшафт складався з ряду ферм: какао, пальм, каучуку, а також інших економічно вигідних товарних культур, причому какао було найважливішою економічно вигідною культурою в регіоні. Детальний аналіз показав, що цей регіон втратив 42% свого лісового покриву за період 1978-2015 рр. Цю динаміку можна вважати катастрофічною. Якщо така тенденція буде тривати в регіоні й надалі, то через 60-70 років Фако-Меме та схили гори Камерун залишаться зовсім без лісу. В такому випадку легко уявити наслідки цих дій. Вирішення даної проблеми в регіоні, потребує прийняття невідкладних адаптивних екологічних стратегій для сталого управління лісами та їх ресурсами.

Ключові слова: історія, господарський розвиток, лісокористування, вирубка лісів, район Фако-Меме, Камерун

Introduction. The tropics harbour a major proportion of the planet’s forest resources. The Fako-Meme region falls into this zone. The Fako-Meme region of Cameroon geographically lies between latitudes 3° 86’’–5° 4’’ N and longitudes 9° 28’’–9° 49’’ E (Fig. 1). It has a surface area of (5,200 km²) with a forest-adjacent population of about 300,000 inhabitants. The overexploitation of these forest landscapes have

yielded great benefits to the local populace living within the forest limits but the beneficiaries have not made commensurate investments for a rational use of these forest resources.

A handful of authors have examined the state of the forest landscapes in little patches and the results of their findings have been recorded as follows. (Hedberg, 1964) noted that Mount Cameroon, which

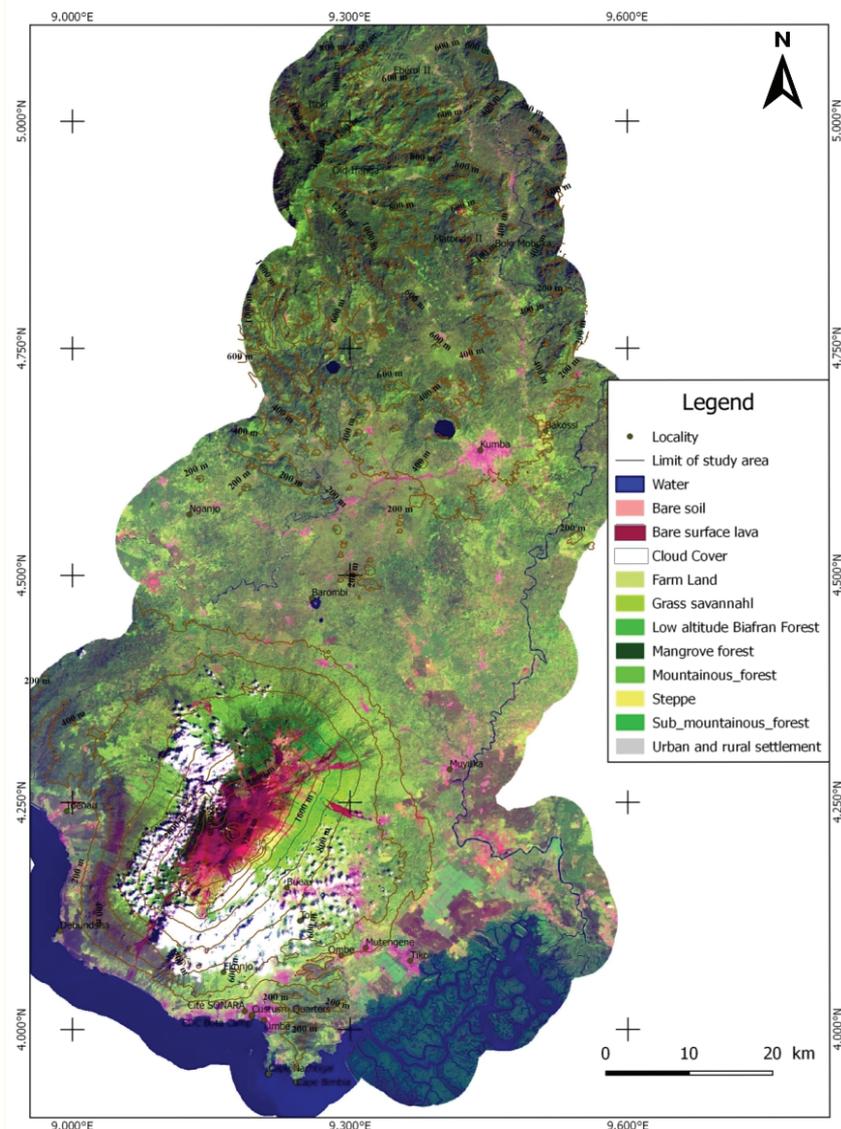


Fig.1. The Satellite Image of the Fako-Meme Forest Region

is an intergral part of the Fako-Meme region, is in the same volcanic chain as the Islands of Bioko (Equatorial Guinea), the Oceanic islands of Sao Tome, Ascuncion and Principe as well as Mount Kupe, Manenguba. The Rumpi Hills in Cameroon has an endemism of about 70% on the highland areas UNCLEAR. This view was equally supported by the opinion that the Mount Cameroon region of Cameroon, aside from South Africa, with its Campo region, is the most biologically rich region on the continent (Letouzey 1968, 1985). The region provides a biological mosaic that contributes to extremely high diversity in the Guineo-Congolian regional area of endemism, and it is regarded as one of the main Pleistocene refugia postulated for Africa (Gartlan, 1989).

The massifs and surrounding foothills of Mount Cameroon contain about 4,000 higher plant species and an estimated 50 of these are endemic to this region. This is the last area in Africa where natural vegetation remains unbroken from lowland forest at sea level to the sub-alpine grassland at the summit. However, it has been noted that this region has recorded significant damage to its ecosystems in the last several decades following the unsustainable use and exploitation of natural resources on the pretext of development (Kah, 2000; Balgah, 2001, 2005; Kometa, 2001; Yerima & Ranst, 2005; Bokwe, 2008, 2013; Mbella, 2011).

This region is estimated to be at the 3rd stage of development (Take-off stage) according to the Rostow Model of Economic Development. This view coincides with several case studies (Lambi & Kah, 2012, Lambi & Mueete, 2016; Lambi et al., 2016; Njabe, 2013; Mukete, 2016 a,b; Mukete, 2017a, b; Mukete et al.; 2016).

These authors have directly or indirectly x-rayed the frustration and traumas happening in the forest landscape of this environment. But despite these laudable efforts, the Fako-Meme forest region has not been given the attention it deserves from policy makers. Since a hungry man is an angry man, the forest-adjacent communities which solely depend on the forest resources for their livelihood, have aggravated the stress and negative implications imposed upon the environment. It is therefore, critical that a more detailed assessment of the history of economic development on the one hand and the use of forest on the other be examined. This article is original and has brought a scientific contribution in the study of forest degradation in the territory. For the first time that the forest landscape has been studied with the use of satellite images comparing anthropogenic activities as presented by the author

within three distinct periods (1978, 2000 and 2015).

The goal of the study was to analyze the history of economic development and use of forest in the Fako-Meme region of Cameroon within the time frame of 1978-2015. The study examined the anthropogenic mutations which have reshaped and transformed the natural forest landscapes into cultural landscapes.

Materials and Methods. Taking into consideration the holistic nature of the forest landscapes in the Fako-Meme region, the use of remote sensing materials was indispensable. Landsat ETM image Files of 1978, 2000 and 2015 were downloaded from the Global Land Cover Facility website and the various bands for each year were modulated and corrected to reveal settlement, roads, farmlands and other geographic features using ENVI 4.3. Open street maps were also downloaded using Global mapper 15 to help reveal the road network, names of towns and villages in that area. 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 various maps as JPEG files. The polygons representing the various parameters were measured using ArcGIS 10.2 and displayed in the form of bar charts using M.S excels 2013. Hence, the methodology was grouped under data collection and data analysis with the use of descriptive, comparative, analytic, cartographic, fieldwork and camera methods of geographical research. Information from available literature and field survey formed the main source of data collection.

Results and Discussion. Understanding the history of economic development and use of forest resources in the Fako-Meme region, necessitated a review of pre-colonial era, the colonial era, independence and post independence Cameroon.

History of forest land-use. The Fako-Meme region falls within the then Southern Cameroon territory. Today it is situated in the southwest region of Cameroon. This region has witnessed four stages of economic and political development, which altered the socio-economic conditions of natural resources management. These periods of change correspond to certain historical developments in the territory (Fig. 2): The pre-colonial period (before the arrival of the German colonists); the German colonial period (1884-1916); the British and French Protectorates (1916-1961); the post independence development (since 1961). Such periodization is usually recommended in landscape studies as it depicts a systematic and chronological impact on the management of natural resources. During these periods we saw the introduction of agro-industrial plantations,

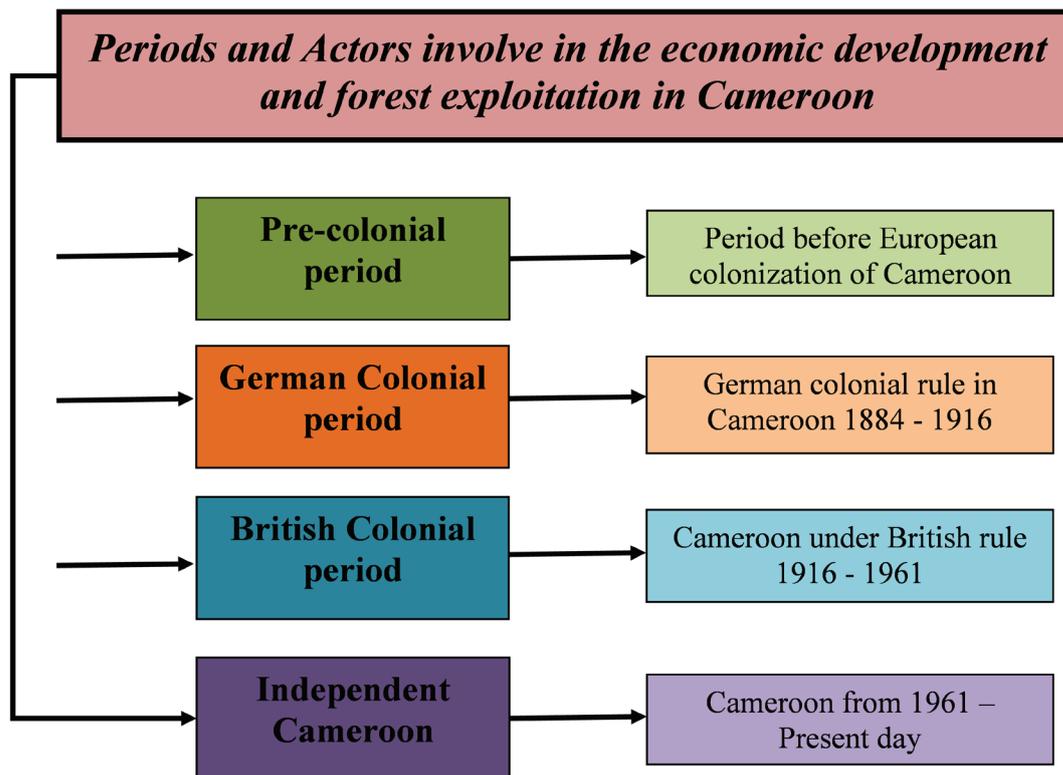


Fig. 2. The periods and actors involved in economic development and forest exploitation in Cameroon

construction of camps for agro-industrial workers, building of gigantic infrastructures, development of roads and railways with other social facilities, which cannot be over emphasized. The sum total of these activities was the gradual opening up of the forest landscapes. Today we witness a steady rape of the forest landscapes which remain only a skeleton of themselves. All this is happening under the pretext of development and the need to feed the burgeoning population using unsustainable agricultural practices.

Pre-colonial Period: The first forest dwellers were hunter-gatherers highly skilled in taking advantage of their forest habitat. They lived in small communities and used tools made of wood and stone and cooked their food over fires. These early populations who still live in the region are ‘insultingly referred to as ‘pygmies’ because of their uncommonly short height. The economy in the Cameroon forest zone at this time was based primarily on shifting cultivation, hunting and gathering. The basis of this subsistence economy was the banana – plantain. These staple crops were introduced into Cameroon through the Bantu migration sometime after the last millennium, and were well established in the south west centuries before European contact. Cassava and cocoyam are native to Latin America and Asia respectively, and were probably introduced to West Africa by Portuguese and British traders sometime

after the sixteenth century. During this period, African societies valued the forest for secondary products such as fruits, nuts, fuel wood and an assortment of herbs and medicines. The main uses of timber were ornamental (carvings etc) and for canoe construction (the trunk of the cam wood tree was especially desirable for this purpose). Even traditional dwellings did not use wood. They were constructed with mud and thatch. Hence, the forest within this period was not tampered since trees could survive the traditional processes of clearing and burning.

German colonial period 1884 – 1916: The total control over land and labour allowed them to convert coastal rainforest into plantation ; by 1913 they had converted 1000sq.km of tropical forest. Agricultural products included palm products, ivory and wild rubber. In 1898 the Germans introduced the concession system for the extensive and systematic extraction of timber. The Gesellschaft Nordwest Kamerun (GNWK) maintained 5,000,000 sq ha in the north that included the northernmost parts of the Southwest. This concessions were focused mainly on plantation agriculture; rubber (*Hevea*), cocoa (*Theobroma*), oil palm (*Elaies*) and coffee (*Coffea*).

British colonial period 1916 – 1961: British ruled Cameroon through the Southern Administration area, which stretched from Lagos through Southern Cameroon and managed most of Nigeria’s rainforest

and hence was responsible for the majority of the colony. Like Germans, the British equally oriented their development towards the expansion of plantation agriculture with the timber industry playing a subsidiary role. We noticed the expansion of traditional agriculture. In Southern Cameroon, Unwin A. I. estimated that there were 14,000 square miles of forest, of which 3,500 were accessible for commercial timber exploitation within this period; deforestation was attributed to shifting cultivation and not timber extraction and plantation (Macpherson, 1917).

Independence 1961 – Present: The Fako-Meme region as a dominant agrarian society which engages about 70% of the population in agriculture and agriculture-related industries is an example *par excellence* of an agricultural cornucopia or the bread basket for many of our (Central African Economic and Monetary Community) CEMAC neighbouring countries. Anthropogenic activities which stems from population growth and urbanization have exhibited far-reaching consequences on the forest landscape of this region. This can be expressed through the loss of forest lands, the destruction of watersheds, the loss of wildlife habitats, the exploitation of less suitable land, the conversion of wild lands for agriculture and urban

uses, which have all contributed directly or indirectly to the further degradation of the forest environment. Most alarmingly, under the current practices, forests are experiencing the highest rates of depletion and degradation. This region has recorded significant damage to its ecosystems in the last several decades following the unsustainable use and exploitation of natural resources (Fig. 3). Therefore, since forest disappearance depends greatly on man’s action, it is evident that the land use is changing. Taking into consideration the fact that the environment is our life support system which includes everything we need to support life, its state is often influenced by the behaviour of those who use it. The Fako-Meme Forest Region has a land use pattern which is relatively distinct. The land use is varied and dynamic; it changes over space and time with population increase and expanding economic exploitation. These changes are represented by the replacement of one land use type by an alternative and gainful economic activity.

The main land use in this area includes forest cover, which include the (Mount Cameroon National Park, forest reserve, community forests and mangroves), plantations and subsistence farmland, settlement with diverse economic activities, which

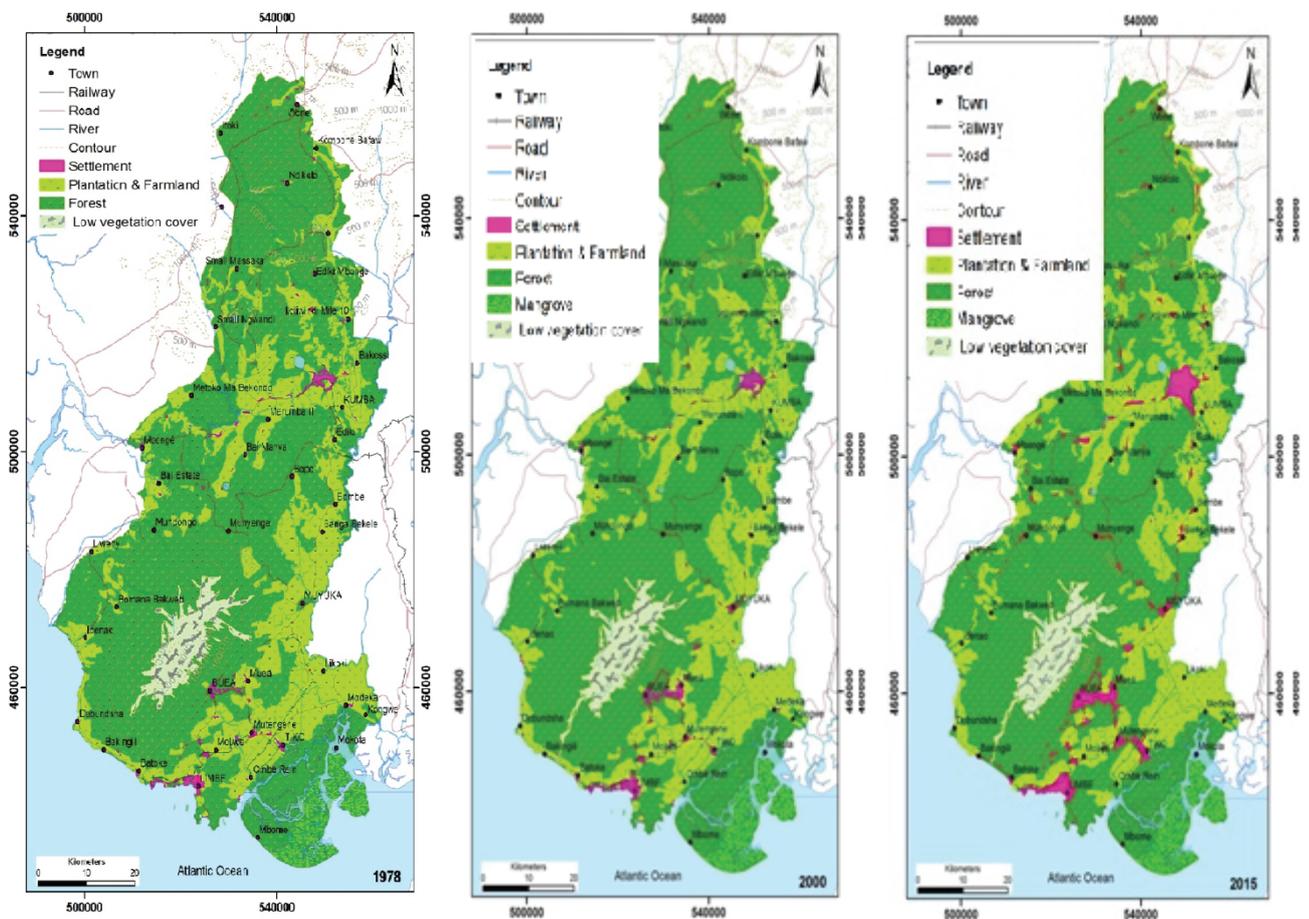


Fig. 3. Change of land-use pattern in the Fako-Meme Forest region (left 1978, middle 2000 and right 2015)

have together reshaped the land use patterns. Taking into cognisance the fact that Cameroon has witnessed a continuous process of deforestation in the last decades, the extent of forest was studied for three periods (1978, 2000 and 2015). The purpose of this assessment was to have a detailed understanding of the mutations and changing land-use pattern in the territory. The results reveals that the region's original vegetation has been altered from thick rain forest to anthropogenic vegetations such as the palm, rubber and banana plantation's of the Cameroon Development Cooperation (CDC) and the man made vegetation such as the Limbe Botanical Garden. The observed changes in the natural vegetation of this area have been as a result of man's activities such as road construction and the building of settlements and agriculture. Human activities in the Fako-Meme region of Cameroon has significantly altered the forest landscape patterns through facilitating the search for more satisfactory living conditions, which has a random but cumulative effect of altering the forest landscapes land use pattern. Surface occupation is presented in Table 1. These data illustrate the observed change in surface occupation from 1978-2000-2015.

Table 1. Fako-Meme Forest Region 1978-2000-2015

Land use types	Surface area 1978 in km ²	Surface area 2000 in km ²	Surface area 2015 in km ²
Forest	3768.76	3213	3008.2
Settlement	34.8	101.3	201.16
Plantation & farmland	217.11	401.01	865.37
Mangrove	1122.04	912.7	414.23
Low vegetation (savanna & prairie)	57.80	302.02	712.04

The use of modern tools such as remote sensing and Geographical Information System (GIS) in the evaluation of surface dynamics is highly advantageous and the results obtained through these processes are often considered to be the most acceptable compared to any other technique (Kah et al., 2000). The structured nature of plantations make it easy to differentiate them from non-plantation surfaces on satellite images even at lower resolutions.

Figure 4 shows that in 1978, forest occupied 3,768.76km of the territory, settlements occupied only 34.8km, the CDC plantations and farmlands around the Fako-Meme forest region of Cameroon occupied 217.11 km², mangroves occupied 1,122.04km while low vegetation (savanna and prairie) occupied 57.80 km of the territory. It is very obvious that within this

period the forest was still at its primordial stage. Human activities were limited only to plantation agriculture introduced by the colonial masters. There was no population pressure on resources.

In the year 2000, we noticed a decrease in forest cover. The forest occupied 3,213 km of the territory. This decrease was caused by an increase in settlement to 101.3 km with an increase in plantation and farmland to 401.01 km². Between 1978 and 2000, plantations had more than doubled their surface area even when we do not take into consideration the spiral effect of this, which includes surfaces transformed for farming and building by the migrants' work. Mangroves had greatly decreased to 912.7 km and equally noticeable is an increase in the area covered by low vegetation (savanna and prairie), 302.02 km.

Despite the high rate of deforestation in this area, forest still remains the major land use. Of the 5,200 km² surface area, forest occupied 3,008.2 km² in 2015. This forest comprises a mixture of the dense forest, degraded forest and areas that have been recently colonized by savanna. It should be made clear that most of this forest is concentrated in the protected areas and forest reserves. Settlement

has equally been in continuous increase. In the year 2015, we noticed a drastic increase to 201.16 km². Plantations and farmland have equally been experiencing an expansion. They have more than doubled in 2015 to 865.37 km². With a surface area \approx 5200 km² in 1978, 72% of the territory of Fako-Meme was covered by forests in (3768.76km), and in 2015 – 42%, that is less than half of the entire area. This dynamic can be considered catastrophic. If this trend continues uninterruptedly in the region, then in 60-70 years, the Fako-Meme and the slopes of Mount Cameroon will be without forest. It is easy to imagine the consequences of this.

In view of the highly dynamic humid tropical landscape arising from the intensified natural and anthropogenic modifications, the natural forest

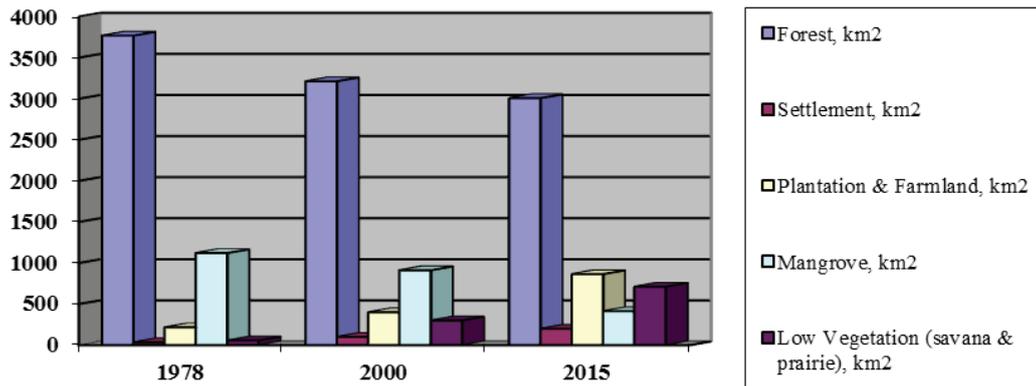


Fig. 4. Surface occupation in the Fako-Meme Forest region (1978, 2000 and 2015)

landscapes by 2015 have been swallowed or consumed by artificial landscapes, which constitute a new and monotonous cultural landscape characterized by typical agricultural landscapes. Most of these landscapes consist of western-oriented plantations in which the monoculture of selected tropical crops has been practiced. As cultural landscapes continue to swallow up the natural ones through the anthropogenic alterations introduced by man in his quest for socio-economic development for better human livelihoods, it is only very clear that the balance between existing natural and anthropogenic systems is overturned. The growing population dynamics and increase in poverty levels, due to which people cannot meet their own subsistence requirements with the means of survival at their disposal, have propelled the forest-adjacent communities of the Fako-Meme region to consider the forest as their only hope of survival. The methods and techniques of agricultural practices they use are very unfriendly to nature as shown in Figure 5.

sustainable alternative livelihood to support the needs of these vulnerable people. Some of these activities are very common in the state reserves because of the state’s negligence of its duty to cater for the needs of forest-adjacent communities. With such dramatic deforestation trends, it is evident that if something is not done, the fate of forest landscapes in the Fako-Meme forest region is at stake. Urgent adaptive environmentally sustainable measures need to be put in practice. Policy makers can no longer afford to turn a blind eye to such environmental damage. Some measures have been proposed by the author, but they await implementation.

Adaptive environmental strategies for the sustainable management of forest resources in the Fako-Meme forest region. The provision of meaningful sustainable livelihoods such as pisciculture and heliculture to replace forest exploitation activities will help to keep the forest healthy. Bee farming has, in the long term, helped



Fig. 5. Slash and Burn Method of Cultivation in the Fako-Meme

Fig. 5 shows an anarchical method of exploitation in the Fako-Meme forest region. This ravaging of the forest is provoked by an increase in the population of the forest-adjacent communities and the lack of

to reduce pressure on the forest. Yet these livelihood alternatives are declining in use and are in the process of being abandoned in the study area because of inadequate subsidization funding. If well managed,

they will become another means of livelihood thereby reducing pressure on the forest.

The formation of organized legally recognised groups (common initiative groups) will make it easier for government to finance sustainable livelihood projects. These groups will be used to sensitize entire communities to conservation strategies. Introduction of environmental education in primary schools, secondary and universities will go a long way to creating environmental awareness.

The provision of social facilities and improved living standards of the forest-adjacent communities will encourage them to collaborate with government on forest management. The use of a participatory forest management approach that integrates the forest-adjacent communities in forest management will promote sustainability. Revising the forestry policies and promulgating laws that treat forest-adjacent communities like friends and not as opponents will enhance rational management of forest resources.

To avoid encroachment and conflicts in state reserves, the boundary of the reserves should be marked with pillars planted to demarcate the border with the surrounding villages as per the German Gazette that created the reserves. The introduction of appropriate harvesting methods and techniques of non-timber forest products and medicinal plants will assure a healthy environment. The control of illegal over-exploitation of forest products, such as debarking *Prunus africana*, will allow the forest to regenerate itself.

Conclusion. The challenges involved in the management of natural resources in the Fako-Meme region call for responses in the form of new management models that take into account the socio-cultural and political framework and peculiarities of the forest-adjacent communities. Community participation in the decision making process of state institutions can ensure that indigenous cultural values of the rural population are taken into consideration in designing strategies for the rational management of natural resources. Involving the forest-adjacent communities in the process of decision-making offers better prospects for the development of sustainable natural resource management strategies now and in the future.

The history of forest use in the Fako-Meme forest region of Cameroon clearly reflects the influence of the colonial masters of Europe. We have identified 4 periods of geographical research. During the first pre-colonial period, the forest was still in its natural stage. Indigenous people concentrated on the cultivation of foodstuffs meant for immediate consumption. The

second period of landscape history in the area was «German colonial rule», which brought the ideas of A. Humboldt and K. Ritter DOUBTFUL .CLARIFY- to local society. The European authorities strove for a reliable and continuous flow of raw materials to Germany and the creation of new economic infrastructures. This led to the creation of large agro-industrial plantations. The third period was British colonial rule of West Cameroon as a mandated territory. The British did not develop the educational system and did not conduct geographic research, but concentrated on export of raw materials to the United Kingdom. The fourth is the period of independent Cameroon .The independent government has carried out major priority efforts to preserve forests, and take care of natural resources for a very long time, but inadequate financial resources and corrupt practices have significantly slowed this development.

Anthropogenic activities, ranging from spontaneous population growth to uncontrolled urban growth, unsustainable agriculture and the spread of agro-industrial plantations and the increased use of fuelwood, have all led to a loss of biodiversity, a decrease in water flows in streams and rivers, and a decline in the quality of «green» tourism, and finally to a decrease in the provision of the population with vital resources in the challenging conditions of a steady increase in the population.

The Fako-Meme forest regions lost 42% of its forest cover between 1978-2015, as revealed by our research. This situation is catastrophic to a region with high biodiversity status. As predicted by the author, if this trend of forest loss is not halted in the coming 60-70 years, this region will be entirely deprived of its forest cover. The author therefore, calls for the implementation of urgent environmental strategies for the sustainable management of forest resources in this region.

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