



# Patterns and Challenges of Forest Resources Conservation in Cameroon

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## Abstract

This paper examines forest conservation dynamics and the ensuing challenges encountered in Cameroon. It assesses forest resources and identifies forest conservation patterns and the various challenges faced by these initiatives. To attain this objective, a broad review of published literature was performed using Semantic Scholar, Google Scholar, Research gate and Web of Science. The study observed that, despite various management practices, enormous challenges still exist which give rise to forest loss at an alarming rate. This is primarily as a result of unsustainable agricultural activities, logging, and urbanization (settlement expansion). Similarly, this study also found the underlying causes of forest loss to include inadequate land for farming, limited access to forest resources, lack of alternative sources of livelihood as well as the increasing value of Non-Timber Forest Products. This study concluded that, forest management can effectively respond to the threats emerging from forest loss through adequate and proper finance, cooperation and support from law enforcement and involvement of local communities in forest management plans.

## Subject Areas

Environmental Sciences, Environmental Sciences

## Keywords

Forest Management, Poverty Alleviation, Forest Conservation, Rural Livelihoods, Tropical Forests, Cameroon

## 1. Introduction

### 1.1. Study Background

Forests are of primordial importance as they serve as timber, fodder and fuel sources for surrounding forest communities as well as playing an important role in regulating the global climate [1]. From monoculture settings to complex ecosystems, these forests are on increasing demand from a growing perspective of stakeholders, such as local communities, nations and even multinational organizations [2] [3].

Similarly, forests also provide various social, recreational and cultural amenities. These varying roles and functions accentuate forest depletion, deforestation, degradation, and low land productivity resulting from weak institutional policies and management strategies [4] [5].

Due to this increasing demand for forest resources and products, forest conservation and management have become increasingly imperative. With the ever-increasing public awareness on the policies of natural resources use, forest conservation paradigms have moved from basic timber exploitation and logging concessions to biodiversity conservation, carbon sequestration, natural resources management, recreational and leisure (ecotourism) development [6] [7]. These conservation initiatives also contribute to climate change mitigation as they tend to curtail forest emissions thus enhancing forest carbon sinks [2].

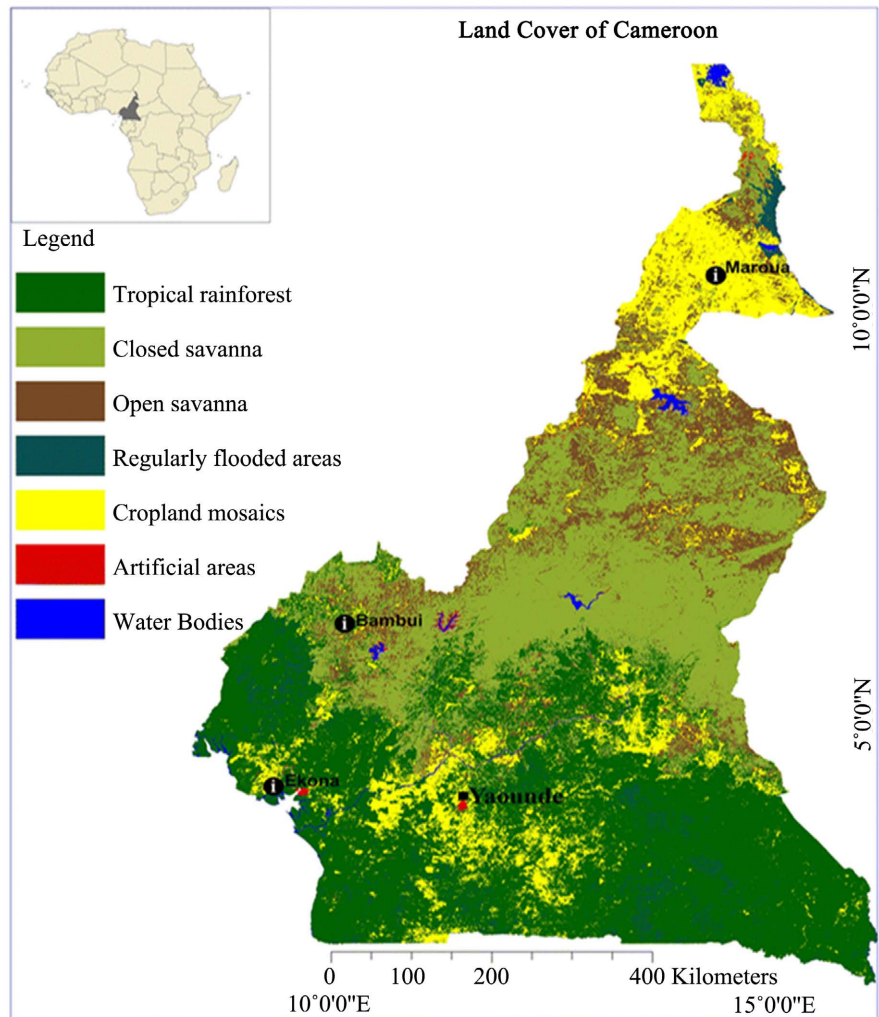
Similarly, as facilitated by scientific and technological tools including television, radio, Geographical Information Systems (GIS) and remote sensing technology, this awareness creation has improved and enhanced forest conservation efforts, inventory programs and policy communication mechanisms [3] [8].

### 1.2. Situational Analysis

Cameroon is located along the coast of West Africa and has an estimated total land area of about 475,440 km<sup>2</sup> mainly covered by forests (42%), agriculture (20.6%) and other land uses (37.7%). Mainly found in the southern zones of the country, these forests constitute the western margins of the Congo Basin Forest [1] [9] (Figure 1).

Despite this richness in forest resources, numerous surrounding rural communities live in and around these forests and on which their livelihoods are reliant. This reliance is related to subsistence agricultural practices and forest tree resources which provide various ecosystem services and goods [10] [11].

This reliance on forest resources is a consequential challenge to forest survival usually leading to deforestation, *in-situ* biodiversity loss and associated forest degradation. The observable forest disappearance and conversion is often likened to a combination of several factors, including the increasing demand for wood, fuelwood, settlement and effects of agricultural expansion [12] [13] [14].



**Figure 1.** Land cover of Cameroon. Source: Yengoh, G and Ardö, J (2014). *AMBIO* 43:175.

[https://www.researchgate.net/publication/255706870\\_Crop\\_Yield\\_Gaps\\_in\\_Cameroon](https://www.researchgate.net/publication/255706870_Crop_Yield_Gaps_in_Cameroon).

### 1.3. Importance of the Study

The present study may act as a base point for policy makers within the forestry sector, national government and local forest dwelling communities to effectively collaborate in designing forest conservation and sustainable livelihood programs geared towards curtailing forest loss, deforestation, forest degradation and rural poverty. The benefits accrued from this effective collaboration would be crucial in providing local forest dwelling communities with essential support services such as wood for artisanal uses, fuelwood, traditional medicines, shelter, various habitats for plants, animals, and safety nets for the fight against climate change impacts.

### 1.4. Methodology of the Study

Such as to obtain a wide and comprehensive overview of forest resources conservation in Cameroon, a general review of published scientific literature was

undertaken by using Semantic scholar, Research gate, Web of Science, Mendeley and Google scholar. The keywords used included Cameroon, forest conservation, forest management, forest resources, climate change, rural livelihoods, forestry sector in Africa, challenges to forest conservation, deforestation and forest degradation. Cameroon is the country of interest while the forestry sector and its conservation paradigms are being explored.

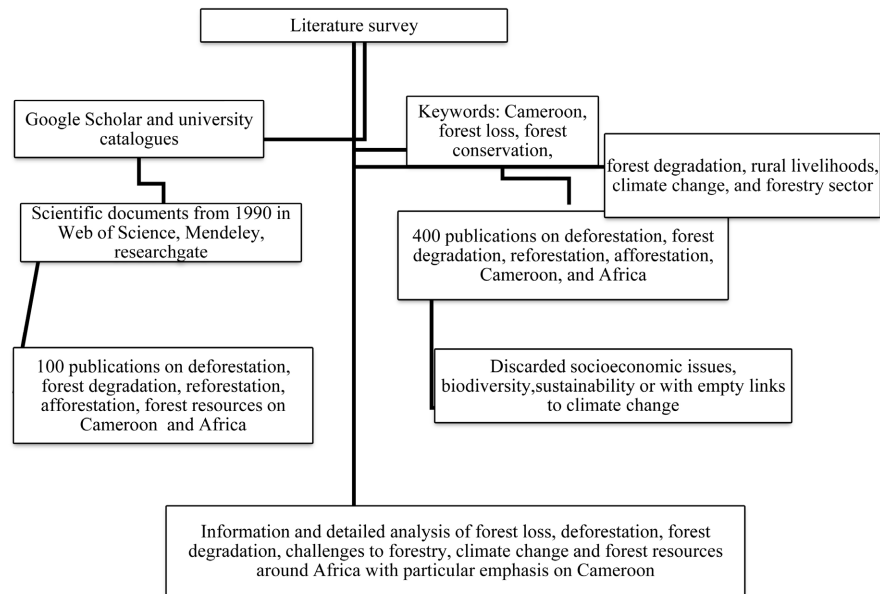
To realize this, online information and other scientific publications for about 30 years were selected and assessed in-order to obtain an inclusive but general search. About 400 online documents were obtained and these were further broken down to forest loss and conservation, forest management, forest resources, climate change, rural livelihoods, forestry sector in Africa, challenges to forest conservation, deforestation and forest degradation around Cameroon. From this perspective, solely documents relevant to forest management, forest resources, climate change, rural livelihoods, forestry sector in Cameroon, challenges to forest conservation, deforestation and forest degradation around Cameroon were examined. Most of the documents obtained were centered around various unrelated subjects and categories of choice. For instance, documents involving studies on sustainability, biodiversity and climate change or which involved dead ends to forest management, forest resources, climate change, rural livelihoods, forestry sector in Africa, challenges to forest conservation, deforestation and forest degradation were discarded.

Amongst the about 400 documents obtained, just over 80 had directly or indirectly looked at forest conservation in Cameroon.

This is because over 70% of these documents presented information from other parts of the globe particularly Asia, southern Africa, Europe and South America with little or nothing from across west Africa in general and Cameroon in particular.

The information derived from these publications and documents, was used to portray a general perspective of forest conservation in west Africa paying particular reference to Cameroon. Similarly, a historical perspective of forest conservation in Cameroon has also been examined. This paper is divided into three parts with the first looking at the historical background of forest conservation across Africa in general and Cameroon in particular. In the second section, the perspectives of forest conservation in Cameroon are explored. The third part explores the challenges of forest conservation efforts with particular emphasis on forest in Cameroon (**Figure 2**).

The purpose of this study was to use published literature in the verification, determination and evaluation of the various challenges facing forest conservation efforts in Cameroon. Furthermore, it also intends to create public awareness on the dangers of forest loss, deforestation and associated impacts. In addition, it is a reference to training of rural forest communities in alternative livelihoods sources, improvement in social services and for policy makers to develop various strategies aimed at addressing forest conservation issues.



**Figure 2.** Flow chart reflecting the literature selection procedure.

## 2. Historical Background of Forest Conservation in Cameroon

According to [15], Africa's people and forest history especially after the Iron Age spreads across three major eras which include a *Pre-colonial occupation* when Africans had free and unlimited forest access; a *colonial and postcolonial era* when Africans lost their free and unlimited access rights to forest land; and finally, a *recent period* of changing conservation involving various methods including but not limited to community forest management.

According to [16] [17], forest resources had been in use even before the onset of colonization. This can be observed through the decrease in forest across Africa alongside the Iron Age from the north towards the east, south and west. Conservation of natural resources including water and grazing lands was controlled by local community laws and usually accompanied by severe punishment. Forest conservation was also necessary because forests often served as hide-outs, religious purposes and sacred groves [16] [17]. This entire colonial era was also an era when Africans lost their rights to surrounding or distant forest use. This was because colonial powers deliberately reserved these forests to serve and provide their various countries with forest resources at the detriment of African communities [18].

For the entire colonial period up to the mid-1990s, the forests of Cameroon were managed through a centrally directed structure and process, which expropriated resources and control from local communities. The policy excluded these communities from accessing forest resources and accruing economic benefits from them [19]. Cameroon's first forestry law dates from 1974, revised in 1981 (law N° 81 - 13 of 21<sup>st</sup> November, 1981) and completed by the 1983 application decree (decree N° 83 - 169 of 12<sup>th</sup> April, 1983). A variety of interacting factors

including donor pressures, international economic interests, local political considerations, local land tenure, land use, and civil society movement pressures, ushered in a people friendly paradigm. These all culminated in the enactment of the 1994 Forestry Law and its complementary decree of application [17] [20].

The Legal Regulations on Forestry and Wildlife (Law N° 94 - 01 of 20<sup>th</sup> January 1994) is the legal framework contributing to the implementation of the National Forestry Action Programme (NFAP). It is an integral part of the government's strategy to ensure sustainable conservation and use of its forestry, ecosystems, wildlife, and fisheries resources. The law lays down regulations with a view to attaining the general objectives of Cameroon's new forest policy. The law also stipulates that, any project susceptible to affect a protected area (industry, mining, and agro-silvo-pastoral) must be accompanied by an environmental impact assessment [21]. Its implementing instruments are made of three specific regulatory decrees (Decrees N° 95 - 531-PM, 95 - 678-PM and 95 - 678-PM) and three common decrees (Decrees N° 86 - 230, 96 - 237-PM and 96 - 238-PM) instruments.

Accordingly, the legal regulations of Law N° 94 - 01 and as amended by decree N° 95 - 466-PM, refer to the putting in place of the political and strategic framework for forest management in Cameroon and as distinguished and categorized by the 1990 guidelines of the International Timber Trade Organization (ITTO) [22].

### 3. Perspectives of Forest Conservation in Cameroon

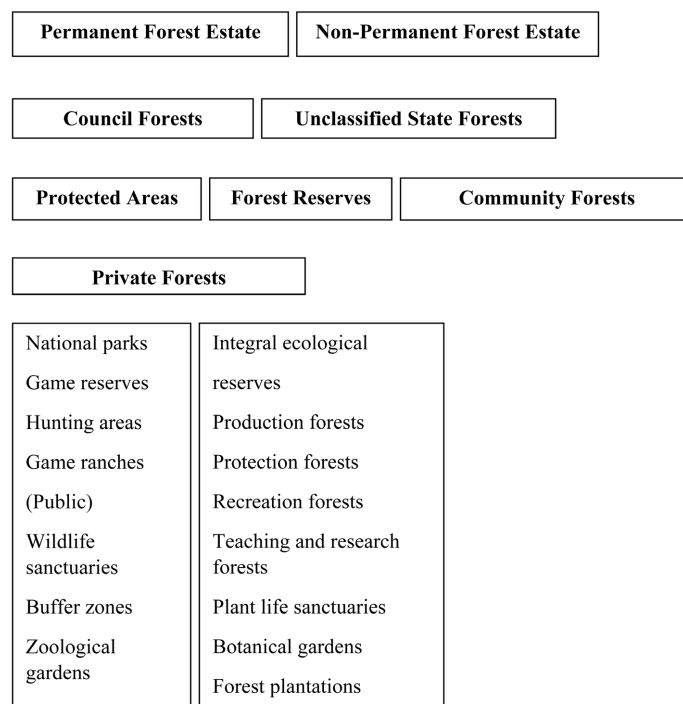
The Cameroon forestry sector has gone through rigorous institutional and legislative reforms, all of which comply with many bilateral and multilateral conventions to which Cameroon is a party [17] [23]. These include among others, the Biological Diversity Convention signed on 14<sup>th</sup> June 1992. This has resulted in a certain number of actions that have significantly modified regulations governing the entire forestry sector and where a Ministry of Environment and Forest was created in 1992 (decree n° 92/069 of 9<sup>th</sup> April 1992). As compared to the former Institute of Agronomic Research, the newly created Institute of Agricultural Research for Development (decree n° 96/050 of 12<sup>th</sup> March 1996) lays more emphasis on forestry and environmental research [17].

In its drive for biological conservation, the country has created many Protected Areas (PAs) aimed at conserving plants and animals. Aside from the about fifteen completed protected areas spreading over an estimated surface area of 19,017 km<sup>2</sup>, there are about thirteen other PAs at various stages of creation and covering an estimated surface area of 6660 km<sup>2</sup>. Furthermore, altogether, there are about eleven national parks covering an estimated 18,069 km<sup>2</sup> as well as several wildlife sanctuaries spreading over an estimated 948 km<sup>2</sup> [24]. About 56% of these areas under some form of protection, are found in the humid tropical zones, with 30% in the tropical wooded savannah and 7% within the montane zones, respectively [14] [24].

Similarly, an indicative zoning plan has been developed for 140,000 km<sup>2</sup> of which about 90,000 km<sup>2</sup> are proposed to be part of the permanent forest estate [25]. In addition, these forest-sector reforms immediately preceding the 1994 law included a National Zoning Plan, (Figure 2). This plan describes forests into National Forest Estate (NFE) consisting of two main land cover types; Permanent Forest Estate (PFE) or land designated as forest or wildlife habitat and Non-Permanent Forest Estate (NPFE) or areas that could be transformed into other land uses and which have specific land use rights and management regimes [21] [25].

The National Zoning Plan is also an indicative framework for land use in the southern forested area, serving as a guideline for the planning, orientation and exploitation of natural resources within the area. In terms of land cover, the NFE contains 55% dense forests and 33% mixed forests, the remaining 12% being land where forests are not the dominant vegetation. Between 2006 and 2011, the PFE increased by 3% to 163,000 km<sup>2</sup>, representing about 35% of the total national land area, surpassing the 30% target stipulated by the 1994 Forestry Law [21]. Forests in the NPFE though small stood at 11,000 km<sup>2</sup> in 2011, 90% of which were community forests (Figure 3).

With the introduction in the early 1990s of community-based approaches in rural development and forest management throughout Africa, principles such as participation and the involvement of local communities in forest management, are progressively being applied [26]. In Cameroon, the emphasis on community



**Figure 3.** Forest legislation and zoning in Cameroon. Source: Forestry Law 94/01 of January 20, 1994; cited in WRI and MINFOF, 2012 and in Meli, 2015.

[https://www.wri.org/sites/default/files/pdf/cameroon\\_atlas\\_english.pdf](https://www.wri.org/sites/default/files/pdf/cameroon_atlas_english.pdf).

participation in forest management mainly arose from its adoption of the resolutions of the 1992 Rio Earth Summit. [14] [27] [28] [29] underline the fact that, the promulgation in 1994 of a new forestry legislation giving local communities the right to forest management, has reinforced this participatory forest management trends in rural Cameroon.

### **Community Forestry and Forest Conservation in Cameroon**

Aside the creation of protected areas, over the past three decades, the government of Cameroon has recognized and implemented the concept of Community Forest Management (CFM) as a potential approach for achieving forest conservation [30]. This concept focuses on improving the livelihood and welfare of rural people and sustaining natural forest systems through local membership and cooperation. Local community groups negotiate, define, and guarantee among themselves an equitable sharing of the entitlements, management functions, and responsibilities for a given set of natural resources [28] [31].

According to Article 3 (II) of Decree No. 94/01 of 20<sup>th</sup> January 1994 Forestry, Wildlife and Fisheries Law in Cameroon, community forests form part of the non-permanent forest estate (usually less than 50 km<sup>2</sup> in area) that is the object of an agreement between the government and a village community [29] [32].

From a wider perspective, community forestry involves governance and management of forest resources by communities for commercial and non-commercial purposes, livelihood, timber production and collection of non-timber forest products, biodiversity conservation and socioreligious purposes. Hence, community forestry is a forest conservation and management approach in which local communities are empowered, grassroot organizations are strengthened and charged with the responsibility for the stewardship, management, and reaping of benefits from their surrounding forests and forest resources [28] [32].

By embracing the concept of community forestry, the government of Cameroon had the explicit aim of involving rural communities in the sustainable management of their forests. This provided them with income-generating mechanisms for equitable and socioeconomic local development. By 2019, there were 430 community forests spread across an estimated total area of about 170,000 km<sup>2</sup> (about 7% of Cameroon's total forest area) [28]. The local communities are given 25 years management duration, which can be renewed every five years by signing an agreement between the forestry administration and the local village community.

### **4. Challenges to Forest Conservation Efforts in Cameroon**

In Cameroon, the forestry sector is managed by the Ministry of Forestry and Wildlife (MINFOF) in collaboration with the Ministry of Environment and Nature Protection and Sustainable Development (MINEPDED) and their decentralized services at both regional and divisional levels [17]. The legal regulations on forestry and wildlife are enshrined in forestry law N° 94 - 01 of 20<sup>th</sup> January 1994



and its legal framework which contributes to the implementation of the National Forestry Action Programme. The legal regulations of this law refer to the putting in place of the political and strategic framework for forest management in Cameroon [29] [30].

Although forest conservation efforts have been rejuvenated since this forestry law, the efforts have been less assuring and promising [5] [33]. Aside from advancements in accessing forestry information, the forestry legislative framework reforms are yet to be elaborated. Therefore, the processes involving forest resources conservation and management planning are often diffused right from their outright conception [5] [34].

This lack of a consensus-oriented approach in the forestry sector has stifled forest sustainability especially as the government has failed in investing on developmental and managerial aptitudes and personnel necessary for the protection and safeguard of forest resources. Also, these setbacks and handicaps of current forest management procedures, fail to provide neither the forum nor the opportunity for the local communities to express their interests in relation to the forests. This is because forestry extension services as offered by the forestry ministry are unreliable, inefficient and fail to address the real problems [5] [34].

According to [9], between 1990 and 2010, Cameroon lost an average of 2200 km<sup>2</sup> (0.90%) of forests per year, around 44,000 km<sup>2</sup> (18.1%) of its forest cover. A 2013 study by Chatham House observed a total of 89 forest concessions in Cameroon and which covered an estimated area of 63,000 km<sup>2</sup> or about one-third of the country's area of dense forest [35]. The study observed that, this high level of illegality in Cameroon's forests is the result of many years of poor governance, endemic corruption, weak institutions, unclear and inappropriate laws and policies [5] [34]. More research in the domain is provided by [35] who observed that, Cameroon has had a larger percentage of its forest logged than any other country on the African continent. As a consequence, a substantial quantity of forest resources and some areas have been logged three or four times, thus seriously resulting in forest degradation rather than the permanent loss of forest cover.

The examples in the preceding are an indication that environmental conservation efforts in Africa in general and Cameroon in particular historically have been given low priority compared to food security, health, education, road construction, and even sports [33]. Here, the long-term requirements and adequate investment programs for conservation management are often overlooked, under the pressure of more immediately pressing issues.

This is an indication of weak political institutions governing most African countries, and which often leads to forest and other environmental resources collapse [36]. In addition, these institutional failures are further exacerbated by long- and short-term market failures that enhance forest degradation, deforestation and other environmental resources depletion. At the same time, it facilitates the higher demands and economic benefits obtained from forest resources harvesting, mining and agricultural activities [10] [37].

Furthermore, processes which enhance the participation and involvement of local communities and other stakeholders such as to ensure proper forest resources conservation are also generally lacking. The long-term threat is the destruction of these forests resources which in turn affects biodiversity conservation and the livelihoods of surrounding forest communities [10] [37].

## 5. Conclusions

The present study observed that Cameroon is endowed with enormous forest resources covering over 42% of the country. Also, just as in other tropical countries, many local communities live around these forests and on which their livelihoods depend. This dependence is particularly based on subsistence agriculture and forest resource harvesting as their major livelihood sources.

The study also found that, the government of Cameroon is supporting forest conservation efforts through the creation of a Ministry of Forestry and Wildlife. Similarly, the country has also promulgated legal regulations on forestry and wildlife signed into a forestry law N° 94 - 01 of 20<sup>th</sup> January 1994. The legal framework of this law contributes to the implementation of the National Forestry Action Programme. This forestry law has also helped the country develop a sustainable forest management plan particularly towards community forestry. Here, the country has witnessed the creation and management of over 430 community forests covering an estimated 1.7 million hectares or 7% of Cameroon's total forest area.

Despite these initiatives, the government still needs various political, forestry and socioeconomic paradigms in order to achieve its forest conservation priorities, policy decisions and limit the impacts of ecological adversity. Therefore, a successful forest conservation plan and management for Cameroon should involve a wide range of political, forestry, socioeconomic, technical and cooperation of all stakeholders at various stages of the forest conservation decision-making process.

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## Conflicts of Interest

The authors declare no conflicts of interest.

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