



Fire on Mount Cameroon Forest

Abstract

Fire is the greatest threat to forest conservation in the Mount Cameroon area, with the potential to detrimentally affect different human activities such as tourism, farming, harvesting of fuel wood, and honey and non-timber forest products for local and economic development.

About 300,000 people are living in villages around Mt. Cameroon and depend solely on forests for their livelihood, using fire as a cheap means of labor and to clear forest land for agriculture, this significantly harms the forests, hydrology, soils, wildlife and human environment and property.

A participatory rapid assessment survey was used to survey about 1,200km² of forest land that is in use. Two experiments were conducted, the first concerned sampling of three areas in the region in which three plots were selected with each plot made up of twin adjacent plots measuring 500m² each. One of the plots was affected by fire and the other not affected by fire. Inventory was conducted in the plots to evaluate the effects of fire and the overall biomass loss. The second dealt with testing the productivity of a burned piece of land and an unburned one on which a leguminous crop *Egusi* was planted and produce collected each harvesting season for a period of four years and weighed.

Overall analysis shows that about 88% of activities on forest are by use of fire with an increasing impact on biodiversity and ecosystems, with population increase and poverty being the major driving force. Results from this study have been used to develop management strategies for conservation purposes, land use planning to ensure food sufficiency for long term, economic, political, social and cultural values of indigenous Bakwerians and others.

Cameroon is one of many countries in Africa facing a litany of environmental problems. Presently, food and water shortages are on the rise, drastic climatic changes, diseases increase, biodiversity loss, modification of species and vegetation cover and landscapes, depletion of soils and strong pressure placed upon ecosystems. A fire management scheme and framework with mitigating solution is put in place to *kill the fire use habit* and to save Mount Cameroon Forest for posterity.

Introduction

Mount Cameroon region covers about 4,500 km², with Cameroon Mountain the highest point at 4,095m above sea level. It is an active volcano with rich volcanic soils and forest being the main attraction to many scientists, economists, sociologists, educationist, tourists, farmers, etc. It is one of the world's natural heritages with large areas of continuous forest cover, from the coastal region with marine forests to the hinterland with tropical evergreen forest, up the slopes of the mountain with sub montane and montane forest to the apex with high altitude grassland.

About 300,000 people are living in the area and fire is commonly employed by the users of these natural resources while carrying out different activities of subsistent farming and cash crop plantation and agriculture dominating. Inappropriate and excessive use of fire is causing perverse outcomes for the forests and is the underlying reason for the present study. There is an urgent need to remediate the situation.

The climate is tropical equatorial having high rainfall and average temperatures conducive for agriculture and high levels of biodiversity. The area has very high levels of species endemism and richness, in part due to the great altitudinal range and the resulting diversity of habitats. Details on the evaluation of forest fires have been recorded, and the significant loss of biodiversity confirmed through studies. Mt. Cameroon has about 42 endemic plant species, 8 species of rare mammals, 8 threatened bird species and many butterflies.

The study area covers about 2,800km² from west coast, upper villages on the mountains slope, Bimbia-Bonadikombo, Bomboko forest reserve and adjoining forest and Southern Bakundu forest area. Field survey assessment methods observed that about 1,200km² of forest land has been used up for various activities and farming taking the highest portion with slash and burn as the main method of farmland preparation.

The study has also elaborated reasons why people in Mt. Cameroon area use fire, its effects on the forest and land forms and environment, and has proposed recommendations towards *killing the forest fire use habit* for sustainable management of the forest and resources.

Objectives and Method of a Fire Study

A fire study was implemented in order to

- Evaluate the causes and effects of forest fires on the Mount Cameroon region for reasons of conservation and sustainable development.
- Develop monitoring and management mechanisms for forest fires in the region for necessity of intervention and defense.
- Establish regulatory and collaboration framework for local people and organizations for information sharing.
- Estimate the value and quantity of biomass burned and the amount of CO₂ emissions in the region

The field survey and assessment, inventory and interactive interviews and collection of data were made as well as analyses on the effects of fire on affected areas compared to chosen non affected standing forest land.

First, the sample areas in the region were selected and comprised two sub-plots of equal sizes measuring 500m² and adjacent to each other. One has to be on an area affected by fire and the other on a non-affected area:

- Plot I: Lava flow track in the upper villages on the Western side of the mountain along a lava flow track
- Plot II: Bomboko forest reserve area on the eastern side of the mountain
- Plot III: Kendongji camp in the southern Bakundu forest reserve along the Buea-Kumba road near Mbalangi village.

Analyses of Plot I on the lava degraded area after the last eruption 9 years ago (in 2000) has not got a single shoot of grass. Fuming steam can still be found on some portions of the lava. Compared to the non-affected area with high vegetation cover, it is estimated that it will take about 100 years for the lava to regain total vegetation cover.

Plots II and III where slash and burn is highly practiced has very unhealthy crops and no vegetation cover, an indication of loss of fertility over the years. When compared to the non-affected plots is a direct opposite of the situation. It is estimated that over 25% carbon dioxide (CO₂) is emitted in the atmosphere. A good quantity of incompletely burned wood is abandoned and finally shall be wasted. In fact, some portions are left completely bare by fires which are very prone to severe erosions.

Random sampling tree count of timber species, non-timber forest product species, lianas, shrubs, other plant species and animal species was enumerated on each of non-affected plots to estimate the average biomass loss on the affected plots.

About 500 effects could be numerated from plant and animal loss including (microorganisms, soil food nutrients, animals and plants in aestivation or hibernation, plants seeds and seedlings, eggs of animals and birds on incubation, young tender newly born living organisms), vegetation cover, soils and soil structure, climate, and hydrology.

Table 1. Biodiversity inventory of the research plots

Faunal Diversity			
Species / Plot	Plot I	Plot II	Plot III
Monkeys	06	08	Non
Chimpanzees	03	06	Non
Bush buck	12	16	20
Porcupine	36	22	16
Bush goat	12	16	22
Crocodiles	0	01	03
Snakes	38	26	23
Cane rats	66	54	46
Elephants	6 footprints and droppings	6 footprints and droppings	None
Birds	362	346	296
Butterflies	226	320	232

Tree Species (Common Names)			
Timber and non timber forest products (common names)	Plot I	Plot II	Plot III
Frake	06	18	22
Bete	04	03	39
Aiele	02	08	14
Ayous	12	14	36
Bilinga	06	03	12
Doussie	13	18	14
Dibetou	04	03	09
Bubinga	08	12	18
Kossipo	11	12	18
Sipo	06	14	20
Dabema	13	16	14
Acajou	03	12	22
Iroko	12	09	10
Moabi	01	04	08
Iron wood	10	14	26
Tiama	03	02	04
Padouk	05	04	26
Pygeum	22	18	0
Tetra pleura	02	05	02
Cola lateritia	02	03	02
Bitter kola	03	02	08
Bush pepper	12	22	26
Njansang	22	34	66
Voacanga	10	14	03
Yohimbe	03	09	01
Bush mango	03	02	15
Quinine Stick	12	18	03

Fire Occurrences in Rainforests of Mount Cameroon

Natural occurrence of fire on Mount Cameroon is noticed during volcanic eruptions, since it is an active volcano and each time it erupts, as was the case on 29 March 1999, there was emissions of very hot and flammable lava that flowed down slopes towards the western coastal side of the mountain in Bakingili. I was there myself amongst the friends of the Limbe Botanic Gardens in the forest at Bakingili when a huge hill of moving hot burning lava of height of about 5m and 200m wide, engulfed, ravaged, and quickly dried up vegetation of both large and small trees alike, wildlife of different varieties plus those that could not escape were in a few seconds burned up into ashes. This

process continued for about three weeks, leaving the entire area completely transformed into a smoky desert. The landform and vegetation cover is degraded, destroyed, displaced and fragmented. In fact hundreds of hectares of forest, biodiversity, ecological habitats and water sheds have gone forever.

Very few cases of fire ignition from lightning have been recorded as was the case in 1996 in Bimbia Bonadikombo in the forest along the Limbe-Ombé road. An accident occurred when a transformer carrying high tension cables that passes through the forest along the Tiko-Douala road exploded in 2002 and caught fire and burning a rubber plantation and the surrounding forest.

Intentional situations frequently occur here where forests are burned for farming purposes. Already mentioned is slash and burn practice of agriculture which is very significant in the area common among subsistent farmers who lack knowledge and means for sustainable alternatives. Local people use fire for harvesting fuel wood and charcoal. Dry woody material and leaves are gathered round the tree and set on fire. When the tree falls, wood and charcoal is collected for household use and for sales. This is done and left overnight and because it is not supervised has the potential to escape and get out of control, burning huge portions of forest. Use of fire for honey harvesting is an old phenomenon here which sometimes results in destruction of forest and bee swamps. A whole tree is set on fire to collect a few liters of honey and the fire ends up consuming large portions of forest.

Fire incidences have been recorded each year during touristic activities and Mount Cameroon race. It is an annual event where the race track is cleared using fire especially on the savannah. When fire is set here due to high wind speed at this altitude fire is carried to distant areas and by virtue of the dryness of the grass, quickly picks up and burns more than the intended portions. Animals escape and move down slopes into the forest where local hunters use this opportunity to trap the animals. Other montane organisms are displaced and lost.

Some tourist, visitors and users of the mountain are careless in the way they handle fire especially cigarette smokers who drop lighted cigarette butts along their path which may pick up fire and grow wild in the forest. Cases of severe harm, deaths and biodiversity loss were recorded on the mountain in 1996, and 1999.

Occasional fire incidents have occurrence from high tension electricity lines that pass through the forest. Fires are caused by explosion of transformers that sets the forest on fire.

Most forest users especially farmers use fire to clear and prepare their farmlands at the beginning of the farming season. Owners of cash crop plantations of rubber, cocoa and palms, use fire as a cheap tool to clear old plantations or burn already cleared material to prepare the land for new planting and it is done without proper demarcation of the plantation boundaries. These fires eventually connect into neighbouring forest as was the case in Mnyenge, Tiko and Idenau on the foot of the mountain. Farmers consider fire to be the easiest, cheapest, and readily affordable alternative for farmland preparation. To do this an average farmer places himself at a very poor position arguing that if he wants to clear and prepare a farm land normally for a piece of land say about 2 hectares, he would require a labor force of about 100 men including saw men and if he has to pay each worker about 4,000 CFA per day, he will be spending a total sum of 400,000 CFA which he cannot afford. It will be very cheap for him to buy a box of Match for 25 CFA, and use just a single stick to light the entire area. He believes this will do the clearing better and quicker and will save hundreds of thousand expenditure compared to having to employ labor.

Another argument raised here is that they have an immediate problem which is that of putting food on the table and will not want to wait for such a long time to go through the normal process of land preparation and planting. Some commonly grown crops especially subsistence crops such as *egusi*, maize, yams, plantains etc. are seasonal that must be cultivated at particular periods of the year for them to do well. This is the reason why farmers would prefer to use fire as a quick means to meet with this cultivation cycle.

Farmers also believe very strongly that crops like *egusi* will do very well with high yields on burned land than in a normal worked land. To investigate this fact, a 1.2km² area at Mbalangi was selected demarcated, and plotted out into six farm plots of 200m² each. Three of these plots were slashed and burned, while the other three were cleared and tilled and cropped with *egusi*. Harvesting was done at the end of the season and produce weighed for each of the plots. This process was conducted in the same conditions for four years and data imputed as on the table:

Table 2. Comparative *egusi* crop yield on burned and unburned plots for a period of four years

Plot (size: 200 m ²)	Crop yield for 1 st year (kg)	Crop yield for 2 nd year (kg)	Crop yield for 3 rd year (kg)	Crop yield for 4 th year (kg)
Plot 1 (burned)	362	360	348	342
Plot 2 (unburned)	242	235	246	248
Plot 3 (burned)	366	368	350	325
Plot 4 (unburned)	240	244	242	248
Plot 5 (burned)	364	366	358	345
Plot 6 (unburned)	244	285	296	312

Quantitative and qualitative analyses of data on table shows that an average yield of unburned plots for 4 years period is 256.83kg while that of burned plots is 354.5kg. These figures reveal that there is an average yield during the 4 years period, whereas for the burned plots, the yield is very high during the first 3 years and falls sharply in the fourth year.

The results confirm the arguments raised by the local people, a scientific hypothesis for this phenomena is outlined as follows; ash from burned wood in the presence of rain water through its siltation process increases the basic mineral content of soils which is readily absorbed by leguminous species. More so, it also increases the cation exchange capacity of the soil. However, leguminous plants such as *egusi* have root nodules that contain nitrogen fixing bacteria which facilitate the plant's nutrition. The symbiotic relationship between the *egusi* plant and the N-fixing bacteria allow the plant to survive in nutrient poor soils. *Egusi* is also a creeping plant so will prefer clean and bare ground through which to creep and implant its root to absorb food nutrients directly to feed the rest of the stem since it will grow to a length of about 20-30m long during its life span. Absorption of food substances will reduce if it had to climb on trees or rough terrain not in contact to the soil and to depend on a single root for main means of nutrition that cannot completely support the whole plant length throughout its life span. It is also believed that soil diseases and pest such as tuber and root gangrier or panama, black soldier ants known here as *blackmans injection* are killed during burning process rendering the land safe for cropping. Also the fire will burn stumps and loosen the soil facilitating free infiltration and circulation of water and air in the ground for easy penetration of roots of crops and for absorption of food substances.

Average Biomass Loss and Volume of Biomass Burned in the Mt. Cameroon National Park

Huge quantities of biomass are burned each year in the region of Mt. Cameroon National Park. The worst affected areas are the top montane and grassland region of the mountain and foothill forest. Remote sensing images have provided information on open areas of slash and burn, but have not estimated the exact quantity of biomass loss in the entire area since some of the burning is done in the forest understory without necessarily felling down the trees. This has created a sparse environment in the understory while the upper canopy appears covered. Authentic estimates can only be made through physical assessment and worth noting is that greater amounts of tropical forest biomass are found in the understory ground cover. Prominent in this observation is that fire is a big threat to some montane forest and grassland on Mt. Cameroon and that on the Eastern side of Mt. Cameroon it has been estimated that up to half of the forest cover is already lost (1). Considering that the lost portion is about a third of the Mt. Cameroon area together with the other portions assessed during the research survey, amounts to about 1200 km² giving an average annual volume of biomass burned to 14,400,000 m³ taking an average vegetation forest height of 12m.

Wild bush fires are recorded on grassland savannah each year from above Hut 1 to the top close to the summit of Mt. Cameroon. These fierce and frequent fires since 1964 led to the enactment of the prohibition of fires regulation of 1964, applying particularly to high altitude areas at and above 1,220m). At such heights, the recovery of vegetation after a fierce fire is very doubtful and frequent fires at short intervals will quickly create a desert condition with attendant dangers (Bulletin of the Ministry of Natural Resources, 3 June 1965). This is exactly the situation on Mt. Cameroon with completely bare mountain tops. This desert conditions are causing serious erosions after rainfalls, carrying runoffs, large rocks freely trooping down slope in to the Buea municipality causing blockage and enormous damages each season. It is an indication of sparse vegetation cover. Fierce fires at

this altitude of the national park not only increase the amounts of CO₂ and other greenhouse gas emissions but amounts to cruelty to animals and against the law of conservation of wildlife.

Volume of biomass burned can be approximately estimated at this portion of the mountain as follows: The elevation of Hut 1 at 04°10.551' N and 009°12.257' E is 1,858 m, while the elevation of the summit at 04°13.081' N and 009°10.802' E is 4,041 m. The difference in elevation from these points gives the perpendicular height of 2,190 m. Mt. Cameroon is a vast dome extending over 45km, meaning radius of 22.5 km and slant distance from Hut 1 to the summit is 22.6 km and the surface area of savannah grassland up to the summit forms a cone with a surface of 3,190 km². The average annual volume of biomass burned at the top grassland savannah taking average vegetation height of 3 m gives 9,569 m³. Putting these two average volumes together gives a total biomass loss of about 23,969 m³. Projections made over a period of 50 years will mean that all vegetation and biodiversity will be lost by this time if dispositions are not made to put in place a good fire management scheme and strict fire policy.

Effects of Fire on Montane and Rainforest of Mount Cameroon

Fire effects in the area are enormous, spanning from forest, climate, hydrology, soils and wildlife, along volcanic lava flow paths, farmlands etc. The soil potential is observed to have been greatly affected and large areas show significant soil degradation. Soils are the most important asset of a nation. Vegetation cover of affected areas here is destroyed, and lost value as over 80% of soil nutrients depends on the forest, reported in (2). Poverty has increased with fall in standards of living as local people now have to go long distances in the neighborhood to collect fire wood for local use and farmers abandoning depleted farms, and opening new farms in the forest reserves.

Frequent volcanic eruptions with lava flows with fire have destroyed very large portions of forests and buried soils leaving entire environment bare. A case study of the 1999-2000 eruption revealed lava flow down slopes in to the Coastal village of Bakingili in the West coast. This caused wild bush fires that burned and ravished large portions of forest on the upper slopes with *Prunus africana* amongst other important forest plants and organisms and large hectares of palm oil plantations on the lower slopes. It also dried up every living thing and melted every non-living thing along its path as it flowed through. Lava height was about the height of an electricity pole. It almost crossed the road just barely about 500m into the Atlantic Ocean. Imagine the distance from the top of the mountain to this point and quantity of biomass consumed. The government of Cameroon intervened with a human rescue, evacuation and resettlement of affected populations at Moliwe, a village in the outskirts of Limbe towards Buea. Through the collaboration efforts of the CDC (Cameroon Development Corporation), resettlement camps were constructed. Some of the villagers resisted and refused to move away from their affected Bakingilli village and that their ancestors will take care of them because their shrines are there buried in the village. They cannot afford to go and abandon these shrines. This seems to have worked as chiefs of this area met together prayed to appease the gods of the mountain *Epassa moto* before the lava could stop at this point immediately at the main road. Serious danger was envisaged if the lava had to enter in to the Atlantic Ocean.

The touristic potentials of the area have dropped compared to the past years. Important caves that used to be habitats of endemic Mt. Cameroon bats have been exposed through constant fires and have lost great numbers of these bats. Habitats for mountain bats that are found only between these the two peaks of Mt. Cameroon and Fernandopo have been lost. Some of these caves were used by native Bakwerians as important traditional ritual sites (performance of traditional rights, the gods of the mountain *Epassa moto*) and as hide-outs and strategic ambush points/warfare tactics for traditional Bakweri Army during the Bakweri-German struggle of 1884 have been exposed. If any of such events occur today, the Bakweri man will not have a hiding place to carry out its activities.

Climatic conditions have changed from the usual cool, foggy, fresh climate of Mount Cameroon area that used to prevail in the past 20 years to higher temperatures and less rainy seasons. Increased scarcity of bush meat and formally common non timber forest products have also been reported as well as important wildlife and plant species have been lost while rendering others endemic such as the Mount Cameroon Francolin (*Francolinus camerunensis*) and the African Elephant (*Loxodonta Africana*) from Mount Cameroon especially on the eastern side of Mount Cameroon (Collar and Stuart, 1988). Landslides, floods and erosions have occurred here especially in the coastal region of Limbe in 2002 causing serious damages of property and loss of human lives. Fire greatly damages the savannah and the forest, a major source of food for animals. These food shortages affects some

animal reproductive and life cycles such as the Mount Cameroon elephant whose reproductive cycles last between 18 to 22 months. The big question is whether there will be enough food to sustain these reproductive cycles if fire occurrences are at high rates as calculated above. This will lead to an eventual decline of numbers of animals and other endemic species.

Water crises and food shortages have been noticed especially around Buea, a cosmopolitan town on the slopes of Mount Cameroon. Most of the water sheds and plant-animal habitats have been lost due to forest fires over the years. For example, Mosole stream which used to flow through the town has been lost completely. Water rationing is the order of the day now in town. Food supplies are increasingly becoming short each year as cultivable areas have been cleared by means of burning and have lost its fertility. Threats of encroachment in to the montane and tropical forest reserve of Bomboko on the eastern slopes of the mountain are ongoing.

In the Mt. Cameroon region frequent fires are caused by hunters who use fire for hunting by setting the bushes and forest on fire. The rising smoke affects the animals and at a certain threshold, will move to the East and West directions. Animals perceive this as danger and moreover, smoke is allergic to animals and will force them to run away. The upward direction is preferable but it is most difficult path to take, so obviously they will prefer the downward perpendicular direction and tracks i.e. "transversal flight", and this is often towards human habitation and hunting trap zones. Hunters take advantage to hunt them and those that are not hunted escape invading the area causing animal-human conflicts. Eventually the competent authority usually will resolve these conflicts by ordering the killing of these animals.

Mitigation of Forest Fires on Mount Cameroon

It has become a common and hardened habit for many years to clear the race track by use of fire during the annual event of the *Mount Cameroon Race of Hope*. Mountain can be observed alight especially the montane forest, grassland savannah and sub alpine forest. The Cameroon Athletics Federation in charge of organizing this event is required to introduce a fire management committee in its collaboration framework involving other government agencies and NGOs in the planning such as the Ministry of Tourism, Ministry of Forestry and Wildlife, Ministry of Environment and Protection of Nature, Mount Cameroon Ecotourism Organization, local stakeholders and community groups.

Other highly affected areas is the Southern Bakundu and Bomboko forest reserves where the local population use slash and burn as a quick means of clearing to encroach into the reserves to open new farms. The bush is usually set on fire overnight and allowed to burn with no control, thus very difficult to track down the culprits. Vigilante groups of forest management committees and traditional councils such as the Bomboko forest management committee and the Mbalangi traditional council have been identified among other community members to collaborate with the government service in charge of forestry and environment, who will make necessary dispositions as required by the law as stipulated in the 1964 law in the prohibition of fire (3). It is stipulated that heavy fines of up to 34,600 CFA or imprisonment for six months or both fine and imprisonment shall be meted on any defaulter. This regulation has been amended and included in the provisions of the present Forestry Law no 94-01 of 20 January 1994 (4) and Environmental Law No. 96/12 of 5 August 1996 (5) of Cameroon.

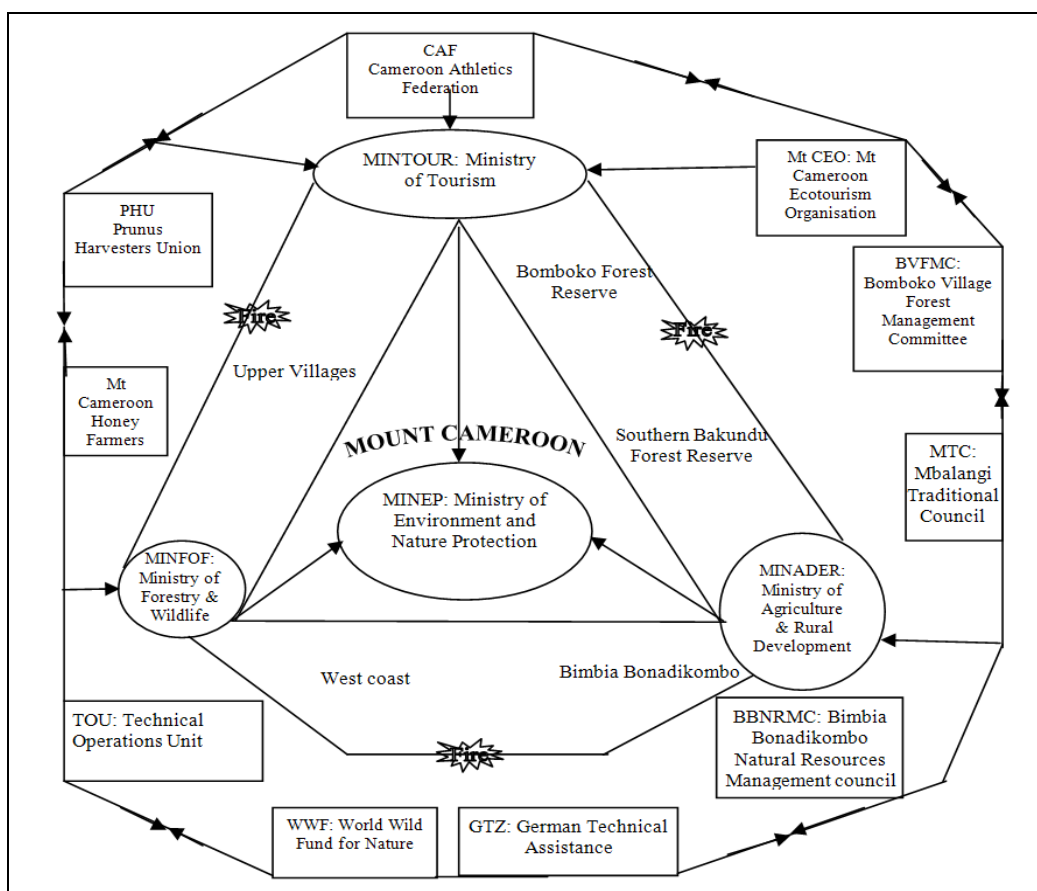


Figure 1. Fire Monitoring Network on Mount Cameroon Region: Circled loops are hunting horns indicating responsible decision making government agencies to which fire information is directed for necessary action. The square boxes are local Institutions and organizations working in the environment and forestry sectors that collect information and feed the ministries concerned. Lastly the arrows show information flow within the management authorities in place.

Modern methods and training for honey collection through production of modern bee hives that do not need use of fire have been programmed to be introduced in communities of the Mount Cameroon area. This however will require some funding and it is envisaged that the ministry of forestry and wildlife will produce low cost hives and distribute to local people. Massive sensitization and training on fire management and its effects on the environment is conducted in academic institutions, community associations and local communities in villages as a means of education because it has been realized that forest users lack good knowledge and have stereotyped belief on use of fire. The sensitization is done through field visits and organization of workshops in the communities and villages concerned and affected in a participatory manner.

It was observed that poverty, population growth and limited resources, is a big drive to forest fires in the area. Government needs to subsidize incomes of local people through operation of micro finance schemes making them readily available and at affordable rates. Also improved varieties of indigenous crop species should be multiplied and given free of charge to increase agricultural production so that in this way household incomes can increase.

Fire Management Scheme as a Solution to Fire Problems in the Area

A fire management scheme is an important, immediate and long term solution to the fire problems that would help to reduce the number and impact of fires on Mt. Cameroon forest. The immediate impact is that the scheme is an integral fire management unit that brings on board all elements, parties and stakeholders within and beyond the Mt. Cameroon National Park area in a participatory manner to curb excessive carbon loss, rehabilitate and restore degraded forests and give the

biodiversity of the region a chance to recover. Through the scheme, water catchments in the region shall be protected thereby resolving water crises plaguing the area. The scheme will provide a sustainable supply source of non-timber forest products (NTFPs), food supplies to local communities, reducing food shortages and improve livelihood standards.

It will provide a forum, an opportunity for all stakeholders in the Mt. Cameroon National Park area to come together to discuss common issues of natural resources management, awareness of forest fire problems, impacts and solutions, and make common decisions that will lead to the formulation of a national fire management policy. This policy will reflect their daily lifestyles, cultures and traditions that will contribute to local and global life support systems. Through the establishment of community tree nurseries and enrichment planting activities will increase the resource base of medicinal plants for traditional and pharmaceutical purposes. Some of the NTFPs and medicinal plants are highly valued by villagers and if encouraged to plant on their farms along with their traditional food crops will prevent them from the use of fires on their farms and neighbouring forest. Some indigenous trees of economic importance including fruit trees, and fast growing timber used by local communities for poles, domestic construction purposes and firewood are included in the scheme. The preferred method of application will be enrichment approach of agro-forestry systems of *Taungya* and mix-cropping on farms to take care of carbon leakage. It will assure local rights to access forests and utilize forest resources. The scheme will provide an opportunity to people of Mt. Cameroon region to fully participate in achieving the Bali Action Plan (1/cp.13), Para 1 (b) and Para (b) (iii) towards a comprehensive process enabling full effective and sustained implementation of the convention through long term cooperative action, now, up to 2012 deadline and beyond.

The scheme will re-awaken and strengthen government surveillance on wildfires and evoke a sense of responsibility and consciousness to all concerned. The scheme provides for on-farm and off-farm activities which are alternative income generating to the benefit of rural living standards, create employment and contribute to the community and village development. The scheme will improve and increase ecosystems services of the National Park, increasing tourist potential and aesthetic value. Hopefully this will generate more revenue through tourism, education and research and employment to fringe village dwellers as porters, guides, bring projects and other activities that will be implemented in the area.

Mt. Cameroon is the identity of the Bakweries, thus, the scheme should enable the indigenous people to promote and maintain culture, spiritual, traditions and customs. Fire is used in agriculture as drivers and a cheap means of encroachment, in to the National Park and other protected areas and reserves, so the scheme will fill these gaps and prevent further encroachment, as well as land tenure issues and conflicts. The scheme will enable the rich biodiversity of endemic and endangered fauna and flora of the Mt. Cameroon National Park area to be conserved and managed sustainably.

Water erosions and accompanied forces will be prevented and protected through the maintenance and improvement of the vegetation cover on the slopes of the Mountain. The scheme will build the capacities through training of village communities and Mt. Cameroon National Park users to acquire knowledge about the effects and damages of deliberate use of fire in their forest. The scheme will improve understanding on the implication of forest fires and reduce excessive use of fire on forest in the region thereby protecting the entire mountain environment, natural resources, ecosystems/habitats for sustainable use and protection of humanity. It also pre-empts environmental health, human security against environmental risk and disasters as Mount Cameroon is an active volcano. The scheme will enable fire management or avoidance of bushfires to be treated as a REDD component on the development of a REDD project for the Mt. Cameroon area with the objective of secure long term financing of Mt. Cameroon national park management and leakage management in addition to the other two components already in existence including avoiding further encroachment by farmers and rehabilitation of already encroached areas.

Conclusions

Preventing forest fire in this region is a very difficult task requiring the collaborative input of many stakeholders. Furthermore, there are several limitations to implementing a fire management plan including gaps in scientific knowledge, lack of personnel and training and monitoring equipment. There is also lack of fire information as there are no records or documents on fire study in the entire sub-region. When these gaps are finally filled, and conservation institutions prioritize fire in their agenda, it will commit everyone to act responsibly to save the Mt. Cameroon forest and beyond.

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