

The Role of Community-Based Ecotourism in Biodiversity Conservation in the Mount Oku Area, Cameroon

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Abstract

Forests are biodiversity hotspots which provide livelihood and act as *safety nets* for adjacent communities. Increasing dependence on forest is threatening this biodiversity. Ecotourism, a biodiversity conservation strategy has the potential to restore degraded habitat, and create socio-cultural and economic benefits that improve communities' livelihoods. This study focused on the role of community-based ecotourism in biodiversity conservation in the Mount Oku forest, of the North West region of Cameroon. The study identified and ranked livelihood activities that led to biodiversity destruction, assessed ecotourism potentials and conservation practices, identified ecotourism benefits and assessed household income levels before and after the institution of ecotourism. We randomly selected three communities from the study area. The study was guided by the Forest Management Plan, the Simple Management Plan of the Kilum/Ijim forest project and the concept of Biosphere Reservation. Descriptive statistics were simple percentages presented on tables, while the inferential statistics of Wilcoxon rank test was used to analyze the data collected for the study. Our findings reveal that, the livelihood activities that led to biodiversity destruction include agriculture, logging, fuelwood collection and grazing. Ecotourism potentials/conservation strategies were nature-based, education-based, culture-based, and agriculture-based; value chain was integrated in all these aspects which enhanced livelihood diversification. The benefits include business opportunities, infrastructure development, and forest regeneration. Income level generated after the institution of ecotourism was higher than the level of income before ($Z = -1442$, $p = 0.001$). Clear indicators need to be established to measure long-term project effectiveness in biodiversity conservation and livelihood sustainability.

Keywords

Conservation, Community Involvement, Cultural Heritage, Livelihood Diversification, Value-Chain

1. Introduction

Forests are hotspots of biodiversity which provide livelihoods and act as safety-nets for adjacent communities. Dependence on these resources increases in times of personal, social and also family hardship (Food and Agriculture Organization of the United Nations, FAO 2020), especially for the poor and marginalized. Forest also comprises a base for a majority of indigenous people's social organization, cultural survival and identities. They also evince strong and deeply rooted historic relationships with their ancestral lands (Foncha, 2012). The relationship between forests and man is cultural, socio-economic and spiritual, and influences customary practices and institutions regarding the management of forest resources (World Conservation Union (IUCN), & World Wide Fund for Nature (WWF), 2019). Increasing exploitation of forest resources is threatening forest biodiversity. In response, conservationists are constantly seeking strategies for the conservation of this biodiversity. These strategies help in the functioning of ecosystems services and in attaining the Sustainable Development Goals. One of such strategies is ecotourism, a conservation strategy based on the sustainable maintenance of ecological values as well as the economic and socio-cultural systems of local communities. Its fundamental principles involve minimizing the negative impact of biodiversity exploitation on the environment, representing local cultures, and actively contributing to the economic well-being of the host community as well as the stakeholders involved. These principles ensure forest conservation and rural development (Wunder, 2017). As noted by (Manu & Kuuder, 2012), ecotourism activities using natural resource attraction in remote areas can be important sources of economic diversification and livelihood opportunities. According to World Conservation Union (IUCN), & World Wide Fund for Nature (WWF) (2019) Community Based Ecotourism (CBE) is used to describe ecotourism ventures that are characterized by high environmental considerations, increased control and involvement of local residents as well as a significant benefits for the host community. As reported by the UN World Tourism Organization (UNWTO, 2012, 2018), the growth of CBE, has been the strongest in the global market due to the positive economic impact on the people and ecological balance. It has been noted that, the management of the forests through the integration of indigenous people and the local communities are effective at both mainstreaming and sustaining biodiversity Islam et al. (2017). This view was supported by Nelson (2015), who reiterated that ecotourism is gaining grounds because it involves local communities, on which lands it operates and is mostly based on their culture and natural assets and attractions. As

documented by the Food and Agriculture Organization of the United Nations, FAO (2020) intensive agriculture and grazing have led to serious degradation of natural resources. Meanwhile Evidence Project funded by the Food and Agriculture Organization of the United Nations (FAO) and the Global Environment Facility (GEF) in collaboration with the Mongolian Ministry of Environment and Tourism and the participation of the local community, reveals that an ecotourism program has been integrated in the biodiversity management plan. This has enhanced forest health and improved habitat, improved carbon sink, created employment, improved income levels and livelihoods, and by extension poverty alleviation as the marginalized participate in national economy programs.

The Mt Oku forest is an important biodiversity hotspot in Cameroon with a high level of endemism. However, within the last three decades, the eco-site has rapidly degraded and is amongst the earliest to have benefited from forest decentralization and devolution policies in Cameroon Foncha & Asongwe (2017). Recognizing the role played by the Mount Oku Forest region in the local economy and culture, the Ministry of The Environment and Forestry (MINEF) and the International Council for Birdlife Conservation (ICPB), now Birdlife International opted to conserve the Mount Oku Forest by involving the local population and addressing their needs. In 1995, an integrated project to form the Kilum-Ijim Forest Project (KIFP) was created with two-fold objectives: ensuring that the biodiversity extent and ecological processes of the Kilum-Ijim Forest are maintained and guaranteeing that the forest is sustainably used by the local community Thomas et al. (2019). The project was facilitated between the communities which members were the primary managers, while the traditional authorities and the government play the role of co-ordination, conflict resolution, technical and legislative support. The inclusive management strategy allowed the stakeholders to revitalize and carry out their function without destroying the forests. It proceeded with the creation of a Technical Operational Unit (TOU), for the KIFP to manage the proposed core conservation area (with species important for ecological processes within each habitat, such as forest regeneration and food web); that was a gazette Plant and animal life Sanctuary. This was followed by the creation of the Core Conservation areas, the Buffer zone which was strictly delineated with only initiatives compatible with the project, and the Transitional or multiple use zone, for local community multiplicity of interest which promotes several development functions. The ecotourism program was an integral part of the KIFP and a conservation strategy. The ecotourism potential of Mount Oku was further endorsed by Frederick & Nguh (2020) who reported the presence of endemic species of plant and animal life which created a plant life sanctuary, and an attractive view from the escapement over Mount Oku and Lake Oku. The conservation strategies were guided by the Biosphere Reserve Concept with the creation of 1) core conservation areas which are strictly protected according to well-defined conservation objectives, consisting of samples of minimally disturbed ecosystems, and taking the form of an *in-situ* conserva-

tion unit; 2) a buffer zone which surrounds the core conservation areas and which is strictly delineated as only initiatives compatible with the protection of the core areas take place there (this area serve to protect the area that could meet future needs for research); 3) and the multiple use zone which surrounds the core areas and the buffer zone. The management of the multiple use zone is usually the responsibility of different authorities and requires appropriate coordination. Similarly, [Food and Agriculture Organization of the United Nations, FAO \(2012\)](#) noted that the Biosphere Reserve Concept, applies the zoning strategies and regulations that prevent the deliberate abuse of a fragile ecosystem, especially those with the creation of a buffer zone. Most of the ecotourism potentials in the Mount Oku Region are found in the core conservation area and buffer zone. This was facilitated by the decentralization and devolution of management rights which allowed communities to form their own governing bodies and make their own decisions and rules. This comprised the first step in empowering local people to manage natural resources in a sustainable manner. The establishment of Forest Management Institutions (FMIs) in forest adjacent communities and the drawing up of Simple Management Plans (SMPs), by each FMI, integrated, supported and strengthened the capacities of these FMIs to manage the forest for conservation and sustainable use [Frederick & Nguh \(2020\)](#).

A Forest Management Plan was further drawn up which comprised the blending of Indigenous Knowledge and scientific methods including the stakeholders. Using the Participatory Rural Appraisal tools, information (on biodiversity resources, history of use, availability of biodiversity resources and traditional rules governing resource use) sought, facilitated the drawing up and implementation of a Simple Management Plan (SMP). The FMIs and traditional authorities handled minor offences in the SMP.

Thus with specific reference to the study area, this study set out to a.) Identify livelihood activities that led to biodiversity destruction, b.) Assess ecotourism potentials and conservation practices, c.) Identify ecotourism benefits and d.) Assess household income levels before and after the institution of ecotourism.

2. Materials and Methods

2.1. Description of the Study Area

The Mount Oku forest in the Northwest Region of Cameroon is located between longitude 10°20'E and 10°35'E and latitude 6°07'N and 6°17'N ([Figure 1](#)). The forest area is made up of the Kilum Mountain range and the Ijim Ridge forests. Located 3011 m above sea level, this forest area covers 20,000 ha [Frederick & Nguh \(2020\)](#). The mountain is part of the Western Highlands of Cameroon, commonly referred to as the Bamenda Highland. The summit of the mountain is very cold and clouded, with mean maximum temperatures ranging between 16.5°C - 19°C and mean minimum temperatures between 19°C - 10.5°C, while the rainfall varies from 2850 to 3050 mm yearly. The area experiences two seasons (rainy and dry). The rainy season runs from May to September while the

and gneiss basement rocks has also occurred. The soils therefore vary greatly. They are strongly influenced by the parent materials, altitude, topography and human activities.

The study started with a reconnaissance survey of background information of the study area from March, 2019 to April, 2020. During this survey three Fondoms (Nso, Oku, and Kom) which were identified and 5 percent for each Forest Management Institution (FMI) were sampled: Bikov 95 people with a population of 1901; Effve-mii, 180 people with a population of 3604; and Muteff 92 people with a population of 1839, for Nso, Oku and Kom Fondoms respectively. This was followed by a transect walk, with the aid of two field assistants who were familiar with the study area. Purposive sampling, was used to select the FMIs based on the fact that they were frontline and secondary villages. The Participatory Rural Appraisal tools (PRA) were used in collecting data; the instruments used included: questionnaires to collect data on ecotourism benefits; Semi-structured Interview (SSI) were used to collect data on ecotourism potentials and conservation practices; group discussions to garner information on household incomes and to identify activities that led to the destruction of biodiversity. Attendance registers of the various FMIs were also explored to obtain complementary information on the level of communities' participation in the KIFP within which ecotourism is an integral part. Using the Simple Management Plan (SMP) of the various FMIs that indicated the forms of ecotourism and based on the transect walk, ecotourism potentials were identified before assessment.

2.2. Data Analyses

Apart from the institutional analyses and development framework deployed for data analysis, data were also subjected to descriptive and inferential statistics (regressions, and correlations) to test the hypotheses using the SPSS package version 17.5.

3. Results and Discussions

3.1. Identification and Ranking of Livelihood Activities that Led to Biodiversity Destruction

The people historically had a close relationship with the forest, as it forms the foundation of their livelihood, provides them with employment, income and shelter including other environmental services like water (watershed). Among the activities carried out in the forest, agriculture was ranked first, > logging > Fuelwood collection > NTFP collection > bush fire > hunting > traditional bee farming > farming tools > grazing.

As seen on **Table 1**, agriculture was high in all FMIs and was ranked first as it is the main activity practiced in the region. Almost every household in this region practices agriculture. Due to population increase, and land scarcity the traditional bush following practices reportedly reduced, and locals were obliged to clear new farmlands, and burnt after clearing to eliminate undergrowth and pest.

Table 1. Identification and ranking of livelihood activities.

S/N	Activities	Emfve-mii FMI (persons)	Bikov FMI (persons)	Mutef FMI (persons)	Total	Ranking
1	Agriculture	38	31	23	92	1 st
2	Logging	46	20	10	76	2 nd
3	Fuelwood collection	26	5	22	53	3 rd
4	NTFP collection	16	7	12	35	4 th
5	Bush fire	15	10	9	34	5 th
6	Hunting	12	6	5	23	6 th
7	Traditional Bee farming	8	8	5	21	7 th
8	Farming tools	9	8	3	20	8 th
9	Grazing	10	0	0	10	9 th
	Total	180	95	89	364	

Source: Researcher's fieldwork, 2020.

Many fire damaged (indigenous methods of cultivation) areas attract farmers as it is traditionally suitable for the cultivation of vegetable and staple food crops in the forests to meet up with the increasing demand for food not only for their communities but also that of nearby urban and peri-urban population [Foncha & Asongwe \(2017\)](#). The lack of access to land due to land tenure challenges also forced the landless into the forest to look for agricultural land. Agricultural activities were characterized by slashing and burning, which accelerated fragmentation and the destruction of habitat. Meanwhile, intensive farming carried out around water courses affected potential water catchment in quality and quantity. Logging was ranked second, with 46 persons for Emfve mii, 20 for Bikov and 10 for Mutef. Logging was carried out for different purposes including, wood carving, construction, fencing, and making of musical instruments. Given that, different species of plants were extracted from the forest, this destroyed canopies, initiating fragmentation and habitat destruction. Logging was the main driver of deforestation and forest fragmentation as these open up additional gap allowing sunlight to reach the under-story and further dry out the forest and soil making it vulnerable to soil degradation, [Foncha \(2012\)](#). The extraction of wood from the forest for wood carving and weaving (handicraft) provided a valuable income to most households, while to some handicraft represented the only source of income [Foncha & Asongwe \(2017\)](#).

The presence of handicraft cooperatives and museums also reportedly exacerbates the pressure on wood extraction from the forests. Fuelwood which emerged as a source of domestic energy and generated income due to simplicity of use and easy accessibility it was ranked third. Fuelwood collection, which was marked third was high in Emfve-mii 26 and Mutef 22 persons. Emfve-mii is a

commercial center with restaurants and local breweries which use mostly firewood for cooking, while Mutef is on the highway and supplies firewood to urban centers, thus fuelwood collection in Emfve-mii and Mutef are for domestic and commercial purposes. On the other hand, in Bikov, it is a secondary activity, as it is collected in the course of farming. NTFP collection was ranked fourth, and it was mostly extracted for medicinal purposes and constituted farm tools, handicraft utensils, roots, leaves, wild foods, barks of trees and shrubs; the Oku Region is noted as the center for traditional medicine in Cameroon. Berries, mushroom and spices are also extracted though not in significant quantities, and this did not involve the cutting down of trees, though the foot path were known to fragment the forest and accelerate forest degradation. In Emfve-mii and Mutef, 16 and 12 persons, respectively, this was done for domestic and commercial purposes, while in Bikov, 7 persons were for home consumption. Bush fire was the fifth activity and it is a secondary activity that leads to degradation. It was associated with agriculture, grazing, hunting and bee farming, all of which are practiced in the FMIs, by 15, 10 and 9 persons for Emfve-mii, Bikov and Mutef respectively. Hunting came in sixth, and this activity was characterized by the burning of forests to flush out mammal, ease the setting of traps as well as the construction of slings from branches of trees. The creation of footpaths also accelerated fragmentation of the forest. In Bikov, 6 persons were involved in hunting, 5 in Mutef and 12 in Emfve-mii. In all these areas the bush meat obtainable was for commercial purpose. Traditional bee farming which was ranked seventh, was enhanced by the rich diversity of plant species and the nectar produced boosted bee farming in all the FMIs. The process of harvesting honey was aided by the use of fire which in most cases often destroyed the forest when not controlled. There was evidence of footpaths leading to beehives and these caused fragmentation. Emfve-mii had 8, Bikov 8 and Mutef 5 persons involved in this activity. Many persons were involved in agriculture in Emfve-mii and Bikov, thus the need for farm tools for harvesting. Those who harvested farm tools stood at 9, 8 and 3 persons for Emfve-mii, Bikov and Mutef respectively. This activity was ranked eighth. Grazing was ranked ninth and was carried out in Emfve-mii only as it is where the Mbororo herdsmen live. The degradation was associated with footpath of grazers, trampling and disintegration of soil, initiating erosion, and preventing vegetation growth. Animals browsed on succulent plants, preventing the regeneration of plants [Quandt et al. \(2017\)](#).

3.2. Assessing Ecotourism Potentials and Conservation Practices

The ecotourism potentials were classified based on the activities Cultural, Agricultural, Educational, Nature (physical environment).

As shown in [Table 2](#) the criteria used to classify the ecotourism potentials as noted by [UNWTO \(2012\)](#); [Singh \(2018\)](#) indicated the culture-based criterion scored 123 and was tied to religious and spiritual beliefs of the community. It however had the highest input stemming from access to sacred grooves, the

use of Camwood in traditional marriage, traditional dances and regalia, artisan-carving, accessories used for polishing and painting of carved products and other inputs were mostly of local origin, and its ancient and core indigenous people's lives, culture and tradition see, **Plate 1**.

Table 2. Ecotourism potentials and conservation practices.

S/N	Ranking Criteria	Scores	Nature Based (physical environment)	Educational Based (Sociology)	Cultural Based (Handicraft)	Agricultural Based (Agroforestry)
1	Access to input	20	12	10	16	14
2	Employment	20	9	8	15	11
3	Market Trend	20	8	9	17	15
4	Alternative use of By Product	20	0	0	16	12
5	Contribution to Household Income	20	13	10	15	16
6	Environmentally Friendly	20	12	13	10	16
7	Enabling Environment	20	10	10	17	15
8	Gender Equity	20	10	12	17	14
9	Total	160	74	72	123	113

Source: Researcher's fieldwork (2020). Note: Each criteria is ranked on 20; Total = 160.



Plate 1. Cultural based.

The variety of local festivals and events demonstrated an on-going sense of pride in the local community's cultural heritage. Employment was also highest as almost all households were engaged in the handicraft industries (men did the carving while women and children polished and painted the carved products). The traditional folk dance and the weaving of baskets, constituted the handicraft sector and were mostly done by women and girls for whom it generated employment. This sector also had the highest market trend as most of the products were sold all over the country in handicraft shops; these products are also sold at the international airports with most tourist buying them as souvenirs. Crafts has become a thriving ecotourism enterprise such that, the value chain of the handicraft industry has also improved market trends. There is a wide range of activities that the craft industry and the workers do to bring their products from its conception to its end and beyond. The byproducts serve as fuelwood and in some cases the wood chips from carved products are used in farms for mulching and weed control especially as a Climate Smart Agriculture (CSA) strategy. Increased employment, and market trends have also increased household incomes although slightly lower for agroforestry which scored lowest in terms of being environmentally-friendly because being a major industry which involves almost every household means that there must be massive cutting down of trees especially local indigenous plants, thus, contributing to carbon emission and exposing the land to degradation. Despite the low score for environmental friendliness, it ranked highest for enabling environment as the main objective of the creation of ecotourism was achieved that biodiversity conservation facilitated the regeneration of forests (with the disappearance of foot paths being an indicator of a reduction in human activity). Culture, which was considered by the indigenes to be masculine oriented, saw more women involved as they contributed not only in the handicraft sector where the finishing was done but other aspects like folk dances, see **Plate 2**.



Plate 2. Educational based.

In all ranked criteria, agriculture-based potentials (agroforestry) scored 113 and were classified second to environmental friendliness which came first. Although agriculture has always been classified as one of the drivers of deforestation and forest degradation, the institution of agroforestry acted as an ecotourism potential for biodiversity conservation. Agroforestry besides being a strategy for sustainable forest/ biodiversity conservation, is also a climate resilient strategy which increases agricultural productivity. The sustainable removal of trees of great value from the forest to farms or home gardens led to wide spread agroforestry which attracted students on research, and local farmers visits to farms, as well as motivated the department of Agriculture and Rural Development to make provision for the regular visits of agro-extension workers to train farmers; constituted access to input, scoring second after culture-based potentials. The practice of agro-forestry focused on a wide range of trees grown on farms, among which are fertilizing trees for land regeneration, soil health; fodder trees that improves smallholder livestock production; timber and fuelwood trees for shelter and energy; fruit trees for nutrition, food security, and medicinal plants (roots, leaves bark of trees) to combat disease. Agroforestry was both a potential for ecotourism and a strategy for biodiversity conservation as it diverted communities' interests from forest and reduced pressure on the resources. The institution of agro-forestry, equally led to the reduction of forest users' conflicts enhancing an enabling environment for the conservation of the forest biodiversity. This has also attracted students on research from nearby agricultural institutions, to these agroforestry farms. Similarly, the women folk who were mostly Non Timber Forest Product (NTFPs) collectors have diverted their interest from forest to farm activities or the other secondary and tertiary livelihood options [David and Kalyan \(2017\)](#). The diversity of agricultural practices in agro-forestry (diversity in crop and animal production systems) was characterized by increased productivity, and generation of employment through activities like, weeding, harvesting, production of animal feed, potters from farms to markets. This ties with studies documented by [Balgah and Nfor \(2017\)](#) and [Singh \(2018\)](#). It was evident that, increased food production led to the creation of restaurants and local brewery industries to cater for tourists. These in turn led to increased market trends and an improved agricultural value chain system, with producers that research, grow and trade food commodities like maize, sweet potatoes; the processors, that process, manufacture and market food products, for example potatoes flour, bread; the distributors including wholesalers and retailers that market and sell food; the consumers that shop, purchase and consume food as well as government agencies that facilitates access to finance/credit through the creation of micro-finance institution for both farmers and small-scale businessmen. By-products like poultry droppings and plant residues were used to improve soil fertility and mulching respectively, which helped to maintain soil moisture. Meanwhile, soya beans and beans residues that contain protein were used to produce feeds for piggery. The all-year round planting, harvesting and

sales of agricultural produce, and the creation of employment increased household incomes and improved living standards. Even those with no farm lands had small businesses related to agricultural products like, restaurants, local brewery and roadside vendors of fruits or foodstuff. These livelihood options diverted the communities' interest away from forest resource exploitation.

The nature based potentials was ranked third with a score of 74. The creation of FMIs has as its objective, the conservation of the forest biodiversity, thus, the input access was mostly the activities of the FMIs and these included: 1) forest regeneration strategies, enrichment planting of seedlings in the degraded areas in the forest, raising of tree nurseries, forest enrichment, 2) forest protection strategies, the planting and maintenance of trees, cairn and signs marking of external boundaries of the forest, using barbed wires along the boundaries, regular patrols to check forest encroachment or the carrying out of illegal activities and fire protection through fire tracing/clearing, education campaign among those farming near the forest boundaries in order to prevent fire from entering the forest, removal of exotic species (especially eucalyptus) from the forest, 3) sustainable harvesting of particular forest products from the buffer zone, dry wood for firewood, rodents, mushroom, alpine bamboo of a certain size 4) quarterly inventory and annual ecological report on the health of the forests, monthly executive meetings of FMI executives on forest management and sustainable projects (ecotourism), weekly FMI meetings to make the communities fully aware of the state of forests (based on SMP) and take corrective measures. These conservation strategies led first, to the attractiveness of the natural area characterized by waterfalls, lake Oku which are habitats for endemic species of reptiles and amphibians like the *Leptopelis nordequa torialis* and *Werneria* and second, the recolonization of the forest birds like Bannerman's *Tucaro*, and *Banded Wattle-eye*, which have attracted ornithologist to the region, Wang et al. (2014). The government of Cameroon, using the International Union for Nature Conservation, IUCN (IUCN, 2014), guide for threatened species created the Plant Life Sanctuary of endemic and the rare species of the study area. In the same light it has been noted (pers. Nformi 2017) through indigenous forms of nature conservation that tied to religious and spiritual beliefs and that teaching the youth about the symbiotic relationship that long existed between man and nature in their community has instilled the culture of protecting some areas of the community which incidentally form a biodiversity "hot spot" Ministry of Tourism and Leisure MINTOUL (2018) Chaudhari & Chaudhari (2017). This has enhanced the nature-based potentials of ecotourism, and protected biodiversity Jaini et al. (2012); Wang et al. (2014) as well as created employment and reduced pressure on forests as the community inhabitants now have livelihood options, which have increased their household incomes. Meanwhile, the inclusion and active participation of women in to the FMIs was a major strategy for gender equity Ministry of Tourism and Leisure MINTOUL (2018).

The education-based potential was scored 72 and ranked fourth. It was re-

vealed that, there is a direct relationship between the education-based and nature based potentials. This attracted environment related departments, Forestry and Wildlife Protection, Environment, Tourism and Agriculture to the area. The government of Cameroon was thus compelled to use the International Union for Nature Conservation, IUCN (2014) guide for threatened species to create the Plant Life Sanctuary of endemic and the rare species of the study area; there is much research going on plant species as much of it is used by traditional doctors and other pharmaceutical companies for example the *Prunus Africana*. The Bio-physical environment, comprises information on the physical environment, forest resources and their use before conservation practices (indigenous Knowledge of conservation) and cultural values attached to it as well as their cultural heritage. The study of the traditional artisans attracted most tourist, and led to the opening up of a women's' empowerment vocational training center that trains the youth on designing their traditional regalia. This can be justified as these two potentials have no alternate use of bi products, indicating that it was service-oriented. Employment was mostly in the form tour guides. Research by students was mostly carried out on the physical environment with very minimal impacts on the environment, thus an enabling environment that favors ecotourism. The slight gap between the ranked criteria was the socio-cultural aspect which sometimes was studied by the tourist. Among all the potentials, it scored the lowest in gender equity, as it was mostly for young males.

3.3. Identification of Ecotourism Benefits

An agreement of benefits sharing was arrived at between the community participation (non FMI and FMI) members on the one hand, and The Ministry of Forestry and Wild life, and The Ministry of Tourism on the other hand. According to this agreement, the entire community benefits from the ecotourism project either as groups or individuals (families/households). In order for it to become effective, a monitory body comprising community members from each FMI within the jurisdiction of the project was created to carry out quarterly reviews.

The benefits associated with ecotourism as indicated in **Table 3** include:

1) The informal sector had more employment opportunities than the formal sector. Employment opportunities in the informal sector were tour guides, drivers, and interpreters, forest guards in the core conservation areas, head potters, bike riders, and local community security agents among others. Almost all households in the sampled FMIs were involved in the handicraft industries in one way or the other, and engaged in activities such as, carving, polishing/painting, weaving of baskets, sales at local shops and engaging them in ecotourism on value chain **Ministry of Tourism and Leisure MINTOUL (2018)**. The formal sector was characterized by recruitment of locals to work in the Sub Divisional Delegation of the Ministries of Tourism; Environment and Nature Protection; and Forestry and wild life.

2) The business Opportunities included small scale businesses like Souvenir

Table 3. Ecotourism benefits.

S/N	Benefits	Description	Percentage
1	Employment	Tour guides, community security, head potters, bike riders, sales girls, book keepers, nursery workers.	34
2	Businesses	Souvenir shops, accommodation, Restaurants, mobile phone shops.	31
3	Infrastructure	Improved energy supply, waste management facilities, improved communication (every household has at least two members with a mobile phone), accessibility to and affordability of portable water, guest-houses, women's empowerment centers.	11
4	Entertainment centers	Town halls, traditional dances against payments, clubs.	9
5	Financial institutions	Micro finances, cooperatives (honey, paper, handicraft, food), "Acawoh" daily and weekly contributions from small traders. These facilitate transactions.	7
6	others	-Capacity and skill building for youths in: documentation, monitoring and evaluation techniques /research, exchange visit, developing marketing network to eliminate middlemen exploitation, reduced travel cost for tourists. -Regeneration of forest: disappearance of footpaths, habitat rehabilitation, forests become darker with much canopy; more animal and bird life; greater control of natural Resources by communities (influence on decision making). Increase in biomass which led to increased soil fertility and stability. -Socio-cultural benefits: maintenance of cultural heritage, preservation of spiritual values, beliefs and customary rituals (habitat of totems), increase in animal life (indigenous conservation strategy), increased intake of traditional diets and recipes.	8

Source: Researcher's fieldwork (2020).

shops (handicraft), restaurants, local brewery industries, provision shops, hair dressing, tailoring workshop (designing traditional outfits), mobile phone shops/operators, homestay (only the homes of registered FMI members offer this facility and benefit from tourists, and this is indicative of the community's commitment to conservation).

3) In terms of infrastructure each site in the different communities was treated separately to ensure that the socio-economic benefits were enjoyed by the locals; in order for it to be cost effective, only local resources were used for infrastructural development. Income generated from ecotourism was ploughed back to the communities through developmental projects like improved energy supply (A remarkable contribution of the handicraft industry in the supply of energy for domestic use), waste management facilities, potable water supply,

guest homes/hotels. Almost all adults in all households had a mobile phone for communication, and in most cases this facilitated ecotourism related businesses [Singh \(2016\)](#).

4) Entertainment centers such as town halls were often hired for cultural, educational (seminars and workshops), and political functions. The hiring of the hall was against payments, which generated income and employment opportunities (caterers/attendants were made available to organizers) for the community [Nelson \(2015\)](#). The clubs served as entertainment centers for tourists and venues where the people portrayed their unique culture and tradition.

5) With regards to financial institutions, there was the creation of weekly, bi-weekly or monthly contributions by members of organized peer or social groups. Ecotourism value chain was facilitated by the different cooperatives coupled with increases in small businesses which attracted the opening up of financial institutions (Micro finance) which were affiliated to the Cameroon Credit Union (CamCul).

6) Others benefits include the regeneration of forests and the restoration of lost biodiversity as FMIs were engaged in tree planting, creation of a Plant Life Sanctuary, protection of forest guards against illegal forest activities, and creation of clubs at the school and village cultural centers where youths took part in conservation activities, [UNWTO \(2018\)](#). There was also the complete disappearance of foot paths, an indication of the reduction of activities in the forest, and forest became darker, with evidence of more animal and bird life in the forest. Capacity building for the youth involved training and skill development in tertiary activities which helped direct their attention away from the forest [David and Kalyan \(2017\)](#). In order for the economic benefit to reach every member of the community, a portion of the charges for tourist guides went to households that belonged to the FMIs, and this has been found to motivate communities to register in their respective FMIs.

3.4. Assessment of Household Income Levels before and after the Institution of Ecotourism

Tables 4-6 indicate the income level of forest users before and after the Ecotourism project in Mutef, Emfve-mii and Bikov FMIs in the Mount Oku Region. There was a general increase in the number of people who earned between 25,000 to 35,000 FCFA and a reduction for those who earned between 45,000 - 55,000 FCFA in all the FMIs studied. In Mutef, before the institution of ecotourism, 3 per cent of the people earned below 25,000 FCFA and this increased to 7 per cent after ecotourism. Those who earned between 45,000 - 55,000 FCFA reduced from 22 per cent to 16 per cent. In Bihkov, before ecotourism, 12.1 per cent of the people earned below 25,000 FCFA and after ecotourism, the number increased to 23.3 per cent, while those who earned between 45,000 - 55,000 FCFA reduced from 16 percent to 7.2 per cent. In Emfve-mii, 10 per cent of the people earned below 25,000 FCFA. This increased after ecotourism by 18.1 per cent, while those earning between 45,000 - 55,000 FCFA reduced from 38 per

Table 4. Income of forest users before and after the ecotourism project in Mutef.

	Monthly income range (FCFA)	No. of persons before	percent	No. of persons after	percent
1	Below 25,000	3	3	6	11
2	25,000 - 35,000	10	11	19	21
3	35,000 - 45,000	17	19	24	25
4	45,000 - 55,000	20	22	14	16
5	55,000 - 65,000	21	24	12	14.
6	65,000 - 75,000	19	21	12	13
	Total	89	100	89	100

Source: Researcher's fieldwork (2019).

Table 5. Income of forest users before and after the ecotourism project in Emfveh-Mii.

	Monthly income range (FCFA)	No. of persons before	percent	No. of persons after	percent
1	Below 25,000	21	10.0	35	18.1
2	25,000 - 35,000	17	7.0	38	22.0
3	35,000 - 45,000	23	11.0	30	23.0
4	45,000 - 55,000	33	31	30	14.2
5	55,000 - 65,000	48	22	20	12.2
6	65,000 - 75,000	38	19.0	27	10.5
	Total	180	100.0	180	100

Source: Researcher's fieldwork (2019).

Table 6. Income of forest users before and after the ecotourism project in Bikov.

	Monthly income range (FCFA)	No. of persons before	percent	No. of persons after	percent
1	Below 25,000	10	12.1	21	23.3
2	25,000 - 35,000	14	13.1	26	28.1
3	35,000 - 45,000	18	22	25	28
4	45,000 - 55,000	21	16	12	7.2
5	55,000 - 65,000	16	18.4	5	6.1
6	65,000 - 75,000	16	18.4	6	7.3
	Total	95	100	95	100

Source: Researcher's fieldwork (2019).

cent to 8.2 percent. In Mutef, before ecotourism, 3 per cent of the people earned below 25,000 FCFA and after ecotourism it increased by 7 per cent, while those between 36,000 - 40,000 FCFA reduced from 19 per cent to 13 percent. The in-

come before and after the institution of the ecotourism project showed the same trend; People earning below 25,000 FCFA were mostly unskilled workers. The mobility of labor is flexible, and most of the jobs available are not time restricted, and can be scheduled according to the convenience of the individual. The number of persons earning 45,000 - 55,000 FCFA decreased after the institution of the project as a result of their jobs being more skilled and more specialized, thus reducing their job mobility chances.

4. Conclusion

Ecotourism has potentials for conservation and community development if planned, managed and implemented in a thoughtful way. This study focused on the role of community-based ecotourism in biodiversity conservation, with focus on the Mount. Oku Forest is a well-known forest in Cameroon with a high level of endemism. The study revealed that the livelihood activities that led to biodiversity destruction include: agriculture > logging > fuelwood collection > NTFP collection > bushfire > hunting > traditional bee farming > farming tools > grazing. The ecotourism potentials were classified into various as follows: nature-based (physical environment), Education-based (sociology), Culture-based (handicraft/artisan), and agriculture-based (agroforestry). The benefits reported were, employment, infrastructural development, creation of entertainment centers, establishment of financial institutions, capacity and skill building, and forest regeneration. In all the three FMIs studied the level of income generated after the institution of ecotourism was higher than the level of income before ($Z = -14.42$, $p = 0.001$). Based on this, it is evident that, ecotourism is a promising conservation and development strategy especially when all stakeholders are involved. However, this will require putting in place an ecosystem policy with stringent mechanism that prevents exploitation, and develop ecotourism potentials that will enhance economic development, and create livelihood opportunities for the local communities. The study recommends the incorporation of efficient institutional capacities at local levels in order for the ecotourism potentials to be fully exploited.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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