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Indigenous knowledge systems and biodiversity conservation on Mount Cameroon

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ABSTRACT

Indigenous People have always provided meanings to natural ecosystems, but knowledge on local environments and their management has been eroded. This study analyses indigenous knowledge systems practiced by the native people of Mount Cameroon and explores their role in biodiversity protection and local livelihoods. To achieve this objective, empirical data were collected from four villages in the study area by conducting focus group discussions, key informant interviews and participant observation. This paper reveals that the forests around Mount Cameroon are essential to the economic and socio-cultural lives of the indigenous population. Furthermore, local institutions play an important role in forest management, and sacred sites, libations, totems, taboos and traditional ceremonies are means through which Indigenous People contribute to biodiversity conservation. Also, conventional forest management regimes such as the village forest management committees have created a new elite class, tensions and conflicts, disregard and weakening of customary laws and institutions. This study augments knowledge on the interrelations between local livelihoods, natural resources and indigenous environmental management systems by depicting how the current loss of biodiversity is perceived to be related to the weakening and erosion of local knowledge.

KEYWORDS

Indigenous knowledge; biodiversity conservation; forest-dependent livelihoods; traditional institutions

1. Introduction

Biodiversity, indigenous knowledge and poverty alleviation are closely connected at local levels. For millennia, Indigenous People have proven that their agency and practices prevail over limitations linked to scientific knowledge, in order to attain sustainable livelihoods and protect the natural environment (Fadeeva et al. 2013). Indigenous knowledge and practices have always served as valuable forms of capital vital to sustainable forestry, effective conservation and ensuring the continuous flow of forest resources that contribute to local livelihoods (Chukwuone et al. 2020). Local institutions considerably shape native people's attitudes towards resource management, while conventional practices of conserving biodiversity – through park creation, imposing fines and imprisonment for defaulters – usually create conflicts between park management and those who are dependent on natural resources. Mavhura and Mushure (2019) expressed that when compared to such modern, often top-down-

imposed strategies, indigenous regimes and practices are more suitable, as they avert tension and necessitate fewer government resources for enforcing regulations to conserve forest resources.

Before Western expansionism and education, indigenous knowledge was grounded on signs, esteem for ancestral spirits and totems. Native communities constructed diverse forms of agency through particular relationships, contacts and interactions with the physical environment and objects around them, thereby permitting the long-term use of forest resources and developing coping strategies in the midst of new and complex conditions such as climate change (Magni 2017). The advent of Western religion and education during the colonial period, and thereafter in the frame of development policy, devalued and negatively coded indigenous beliefs and agency through acculturation and enculturation (Ajonina et al. 2017; Kosoe et al. 2019). However, the Convention on Biological Diversity recognises the link between indigenous knowledge and the environment, and encourages the respect and preservation of indigenous knowledge (SCBD 2001). Although interest and pertinence of indigenous agency have been documented, it is still not integrated in biodiversity conservation and management, and continues to erode. This could be explained by the fact that development practitioners who are trained in the West pay less attention to indigenous agency and manage natural resources in a technocratic manner, and often see Indigenous People as unschooled, untrained and inexperienced. The progression of formal education and modernisation has weakened the significance of indigenous knowledge. Today, indigenous knowledge on biodiversity management accounts only for a little portion of the Mount Cameroon region, but local agency and practices can supplement scientific knowledge on biodiversity and ecosystems, and enhance conservation strategies (Nebasifu and Atong 2019a).

Forests are sources of ecosystem goods and services, socio-cultural values and ecological recycling (Fisher et al. 2014). However, natural environments are declining worldwide, and human livelihoods are far from being sustained (Mavhura and Mushure 2019). The Mount Cameroon region, the focus area of this study, has witnessed enormous transformation and degradation of its ecosystem. For hundreds of years, traders, researchers and colonial administrators have been attracted by its rich and fertile soils. Following several conflicts, in 1901, the German colonisers established their capital in Buea, the core of Bakweri land. The Bakweri people were forced out of their lands to create large-scale banana, tea, rubber and palm oil plantations that are currently managed by the Cameroon Development Corporation (Ardener 1996), thereby infringing upon and devastating forest and wildlife species. The demand for natural resources continues with new players interested in the fertile agricultural soils, timber and currently oil (Laird et al. 2011). Market access and profit orientation encourage the unsustainable exploitation of natural resources. Climate change is posing a new threat to ecosystems and rendering the attainment of conservation and development goals particularly difficult. Alongside, traditional agency and practices have changed and embraced outside views on forest, land and resources for many years, although the extent of cultural and social adjustment has perhaps never been greater (Laird et al. 2011).

Tropical forests are hotspots of biodiversity, however, approximately 70 million hectares of primary forests were lost worldwide between 1995 and 2015 (Mohebalian and Aguilar 2018). According to IPBES (2019), about 1 million species are at risk. Particularly, the degree of global change in biodiversity over the past 50 years is extraordinary (IPBES 2020).

The fast deterioration of biodiversity and its impacts on people's livelihoods implies that the goals stipulated in the Aichi Biodiversity Targets, the 2030 Sustainable Development Agenda and the Paris Agreement will not be achieved grounded on current trajectories.

Notwithstanding, research often centres on biodiversity loss by focusing on park creation, unsustainable harvesting, the marketing of non-timber forest products (NTFPs) and ecosystem services (Lambi and Moto 2016), without exploring the role of indigenous knowledge in forest management. Considering the multiple challenges facing forest environments, and the increasing need to reinforce and recognise indigenous knowledge, this study asks the following questions: What are the forms of indigenous knowledge and practices? What is their role in safeguarding biodiversity against depletion? What forest- and livelihood-related indigenous practices contribute to the sustainable use of forest environments and enhance livelihoods? Understanding indigenous knowledge systems could be useful for conservation projects and policymakers in the fight against biodiversity depletion and poverty. The paper is structured as follows. Section 2 focuses on indigenous knowledge, section 3 refers to biodiversity conservation in Cameroon, section 4 describes the study site and methodology and section 5 dwells on traditional indigenous forestry regimes at Mount Cameroon. The findings are discussed in section 6, which is followed by a conclusion.

2. Indigenous knowledge

Indigenous knowledge is the foundation for comprehending the realities of native people in terms of forests and natural resources management (Reniko et al. 2018; Mazzocchi 2020). Alternative expressions are 'traditional knowledge', 'peasant knowledge', 'rural knowledge' or 'local knowledge' (Tharakan 2015). In this study, indigenous, local and traditional knowledge are used interchangeably, but they are all sources of capital-sharing of mutual significance and understanding (Soh and Omar 2012). Indigenous knowledge is learnt, created and conserved over periods of time by consecutive generations (Kelbessa 2013). It involves all forms of agency and capabilities jointly employed by indigenous communities to govern and direct traditional ways of living, and to guarantee communal well-being (Kaunga 2017). It comprises proverbs, rituals and customs, individual beliefs, metaphors and teachings, emanating from seniors, parents and eyewitnesses (Soh and Omar 2012; Rudiak-Gould 2014). Furthermore, it represents the viewpoints and experiences of the native people assimilated through observation, demonstration, imitation, learning by doing and interaction with the environment (Fongod et al. 2014). The collective nature of indigenous knowledge underpins its traditionally in-built concept with different management and social features, which are believed to be interconnected (Orlove et al. 2010).

Until a few years ago, the idea of indigenous knowledge systems was met with some scepticism (Fadeeva et al. 2013). Nonetheless, some forest and fauna management systems grounded on local knowledge continue to sustain indigenous livelihoods without threatening the biodiversity, structure and operational veracity of forests and their related environmental systems (Reniko et al. 2018). It is important to deal with local knowledge systems in the context of biodiversity conservation, because people and societies have diverse routes via which they know, appreciate, perceive and respond to their environments. Also, they use many mechanisms and practices separately and jointly in the management of their natural world. Despite the widespread significance of indigenous knowledge and practices,

mainstream conservation systems fail to consider this type of knowledge in protecting biodiversity and consequently the livelihoods of native people, thus leading to conflicts, food crises and increasing poverty (Fadhilia et al. 2016).

3. Biodiversity Conservation in Cameroon

The Cameroon forestry policy has colonial inclinations, in that it copies Western models and philosophies (Ngwasiri 2001). Cameroon has a protracted record of poor ecological management, expounded by the absence of detail and lucidity in its constitution on ecological concerns after gaining independence (Taylor 2015). In 1972, the fusion of the two Cameroons weakened and maintained little of the British notion of communal land (Ngwasiri 2001), hence upholding the French concept of the state as a unique "landlord" (Foaham 2001). In the 1970s, the government stamped out indigenous tenure privileges and instituted a system of land cataloguing, which was not acceptable to local people (Ngwasiri 2001). Up to the 1980s, Indigenous People's involvement in biodiversity conservation was not at all on the government agenda (Haller and Galvin 2008), as expressed in Law No. 81/12 of 27 November 1981, which positioned all natural ecosystems under government command (Taylor 2015). After the 1980s, there was a model change from government management to community consciousness and involvement, grounded on the understanding that top-down schemes such as patrolling, reserves and parks had failed to meet envisioned goals (Haller and Galvin 2008; Ingram 2014).

To protect forests and biodiversity, the Government of Cameroon (GoC) created the Ministry of Environment and Forest in 1992 and adopted the Forestry and Wildlife Law in 1994 (Lambi et al. 2012; Taylor 2015), devolving forest management responsibility to the local communities. The new law allowed NGOs to work in association with these people in the creation of community forests. In addition, the GoC formed the Institute of Agricultural Research for Development in 1996, with an emphasis on forestry and ecological research (Foaham 2001), and a national environmental management plan was accepted, setting the standard for biodiversity conservation and impact assessments (Lambi et al. 2012; Taylor 2015). The GoC formed the Ministry of Forestry and Wildlife (MINFOF) in 2004 and the Ministry of Environment, Nature Protection and Sustainable Development (MINEPDED) in 2012. The conservation of protected areas in Cameroon is under the responsibility of MINFOF, while MINEPDED is responsible for reducing emissions caused by deforestation and forest degradation (Awung and Marchant 2016) and the enhancement of 'Cornerstone 3′ of the Convention on Biological Diversity, grounded on access to – and the unbiased and fair allocation of – collective resources (MINEPDED 2016).

4. Case study mount cameroon

4.1 Study site

The Mount Cameroon National Park (MCNP) is situated in the south-western region of Cameroon (Figure 1), near the Gulf of Guinea. It hosts a population of about 450,000 people, some of whom live in altitudes up to 1,500 m (MINFOF 2014). Indigenous People living around Mount Cameroon consist of the Bakweri, Bakolle, Balong, Bomboko, Isabu and Wovea. They have similarities in their spoken language and perceive the mountain is

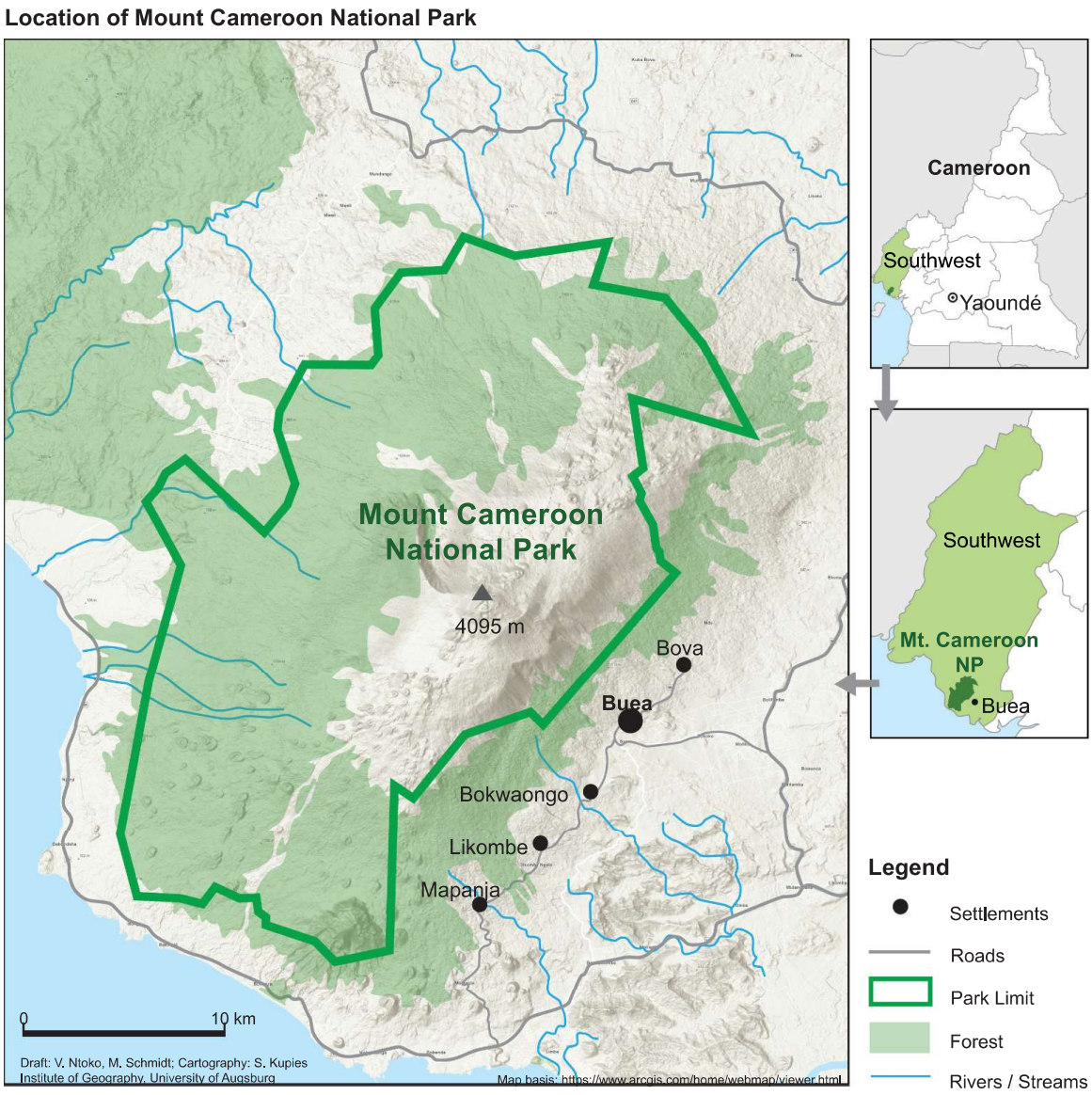

Figure 1. Mount Cameroon region and location of the study villages.

their ancestral habitat (Ardener 1996). Their share of the total population is decreasing due to high immigration rates. The young volcanic soils at Mount Cameroon are fertile and desirable for farming, and so agriculture provides 80% of household revenue, supplemented by petty trading and hunting. The study communities practice agriculture in small farms, which are models of agroforestry of food crops, non-timber forest products (NTFPs) and timber species (Ministry of Forestry and Wildlife (MINFOF) 2014). The population collects NTFPs from the forest and montane grasslands, which have an important impact on their economy and well-being (Forboseh et al. 2011). The main NTFPs collected consist of *Gnetum africanum, Tetrapleura tetraptera, Piper guineense, Afrostyrax lepidophyllus, Ricinodendron heudelotti, Heinsia crinita, Afromomum spp., Dacryodes edulis, Prunus africana* and *Tetracarpidium conophorum* (Ministry of Forestry and Wildlife (MINFOF) 2014). Key fauna species consist of various monkey species (mainly in the genus *Cercopithecus* and *Cercocebus*), chimpanzee (*Pan troglodytes elliotii*), and forest elephant (*Loxodenta africana cyclotis*) (Forboseh et al. 2011; IUCN 2014). Local people also ascribe

spiritual and ancestral importance to the forest, directed by the notion that forest resources have an innate value conferred to them by God (Kelbessa 2013). In turn, these resources enable actors to realise conservation and development objectives and serve as safety nets for poor households (Gaymard et al. 2015).

Mount Cameroon is surrounded by 41 village communities, whose existence is dependent on the forest (Ministry of Forestry and Wildlife (MINFOF) 2014). The forest provides food, refuge and life, and is considered to have spiritual powers used by individuals to shape their day-to-day life (Ardener 1996). Today, the Bakweri mix both ancestral worship and Christian religion. Many settlements formerly inhabited only by the indigenes have become densely populated (Nebasifi and Atong 2019a). For decades, workers on the agro-industrial plantations have migrated from other areas of Cameroon (Konings and Nyamnjoh 2003).

Land management on Mount Cameroon has greatly evolved over time. After the colonial German rule, which led to the relocation of Indigenous People (Pemunta 2018), land use, acquisition and control became a state issue. The government enacted laws to reinforce its control over the territory. It created the Mount Cameroon National Park (MCNP) in 2009 (formerly Bakweri customary land) enacting measures to control forest resources utilisation. To involve local communities, park management adopted a participatory approach and later a collaborative management regime. It also created village forest management committees (VFMC) and signed Conservation Development Agreements with the communities. According to Kemmler and Baumgart (2014), these structures are top-down driven, not representative of all stakeholders and are thus seen as a state apparatus. They provide no opportunity for Indigenous People to exercise traditional forest use rights (Nebasifu and Atong 2019b). Also, park creation was criticised for being entrenched with unclear conventional management and indigenous tenure rights. Conflicts arose due to restricted access, abuse of user rights, local involvement in park management and land ownership (Van Vliet 2010; Ingram 2014).

4.2 Methods

This study is grounded on empirical research that was carried out between April and August 2018, using various data collection techniques. Focus group discussions and expert interviews were held in the four study villages Mapanja, Likombe, Bova and Bokwaongo (Figure 1). While Bokwaongo is heterogeneous, the other villages are mainly indigenous. The study villages are situated on the southern slopes of Mount Cameroon. Twelve key informant interviews (solely men) were held with village elders and hunters as follows: Bokwaongo (04), Bova (02); Mapanja (03) and Likombe (03). These persons were selected based on their understanding of traditional forest management systems. A total of eleven focus group discussions (Table 1) were carried out; four each with traditional councils and VFMCs, and three with hunters. The majority of participants in focus groups were men (60), the reason being that men are more involved in forest management and activities such as hunting and traditional rites. The group discussions permitted those with limited education to express themselves freely, and information was verified from different respondents, in order to enhance the comprehension of attitudes and views on indigenous knowledge. A non-probability sampling technique was used, including snowballing and purposive sampling, which helped identify people – especially the older generation – with knowledge of traditional practices used in biodiversity conservation. This sampling

Table 1. Gender composition of the focus groups.

		Gender	
Type of group	Name of village	Male	Female
Traditional council	Bokwaongo	03	01
	Bova	13	01
	Mapanja	04	01
	Likombe	06	-
	Total	**26**	**03**
Village forest management committee	Bokwaongo	04	01
	Bova	08	-
	Mapanja	04	-
	Likombe	04	-
	Total	**20**	**01**
Hunters	Bokwaongo	07	-
	Likombe	03	-
	Bova	04	-
	Total	**14**	**0**
	General Total	**60**	**04**

technique was chosen specifically, as it provided in-depth information and permitted triangulation for the purpose of reliability. Participant observation was also employed by attending meetings with hunter groups and traditional councils. Secondary data relating to themes addressed in the study were collected from existing literature. In terms of data analysis, qualitative data from the interviews and group discussions were analysed using MAXQDA software.

5. Traditional biodiversity conservation systems

Protection of trees for housing and medicinal use

The empirical data illustrate that indigenous communities protect certain tree species based on their importance to local livelihoods. According to informants from Bokwaongo, the principal tree used for housing construction is *Raphia hookeri* (traditionally called *matutu manakamba*), while tree bark from *Cordia millenii* (trad. *Wombah* or "drummer tree") is used as ceiling and roofing mats. Traditionally, the bark of *Cordia millenii* is used for stomach cleaning, cure heart palpitations and back pain, while the local wine from *Raphia hookeri* helps to treat joint pains and to improve vision. Traditional village councils encourage inhabitants to plant these trees because of their medicinal and socio-economic value. An elderly man from Bokwaongo underlined this point as follows:

> *The traditional council advises the population to plant these important tree species because of their vitality for construction and medicines. Those who refuse to plant these important tree species are levied fines of either a pig, a goat or drinks.*

Focus group discussions further revealed that all traditional councils are in charge of handling conflicts stemming from the abusive exploitation or misuse of natural resources. Punishment depends on the value of the tree and the attitude of the defaulter. In terms of illegal timber exploitation on individual farm or communal lands, the traditional council following local bylaws asks for payments worth the price of the wood. Fines range from 20,000–40,000 CFA-Franc (ca. 30–60 €) and the provision of a crate of beer, depending on the value and volume of the wood.

Sacred places and shrines

The livelihoods and resources used by the people of the Mount Cameroon region are influenced by their reverence for shrines and sacred spots. Entering the "black bush" (thick forest) for timber exploitation, the collection of plants and hunting is restricted, due to the presence of shrines and sacred places belonging to individuals and the community. The shrines and sacred spots are respected as a result of their vital links to local tradition. This includes *Leola Gbeya* and *Liye na gome*, meaning "dancing stone". Moreover, these sacred places provide safe ancestral access to the forest and protect forest users from harm and danger. In addition, dancing spots are generally respected, and no hunting or tree felling is authorised. Also protected is *Wezasoo*, the principal community libation area. Animals are perceived to leave other sections of the forest to assemble here, and villagers are not allowed to remove animals found in this area, regardless of whether they are dead or alive. The respondents said that currently, they obtain authorisation from the parks authority before going to *Wezasoo*, which is problematic and contrary to their tradition. Also, women are prohibited from going to these sacred spots. A village elder from Likombe expressed that the lack of access to these sacred places and shrines is very detrimental to their traditions and to biodiversity, since they believe that the sacredness and rites carried out in these areas protect humans and nature.

Access and collection of forest resources

Traditionally, access to and utilisation of natural resources varied between indigenes and non-indigenes residing in the villages. Non-locals in need of a natural resource for local treatment or timber for construction had to consult the local council for permission to access it. Within the local council existed a committee in charge of forestry affairs, which designated a guide for non-indigenes wanting to visit the forest and use its resources. They were prohibited from going into the forest without a guide, because they could led astray by mystical powers or go against traditional laws, either by killing an animal or stepping into a sacred place. To maintain the sacredness and sustainability of fauna and flora, elders of Bova village noted:

> *Non-indigenes who needed medicinal plants were not authorised to harvest by themselves. An indigene must harvest the herb and provide it to the stranger to preserve its value and enhance sustainability. We guided villagers not to uproot entire medicinal plants but to collect a few leaves or uproot one or two stems and leave the rest.*

Non-indigenes were not allowed to harvest medicinal plants, in order to avoid eradicating them completely, to ensure sustainability and to enhance efficiency during treatment, thereby depicting an association between the traditional healthcare belief system and environmental protection. Nevertheless, the interviewees expressed that the presence of forest guards and the creation of VFMCs has weakened the role of traditional councils in forest resource management. Non-indigenes no longer seek permission from the traditional council before collecting timber and medicinal plants thereby eroding the sacredness and effectiveness of traditional treatment.

Traditional hunting strategies

Discussions with the hunters revealed that wildlife management was the responsibility of the entire village and user groups. To reduce wildlife impacts on crops and humans, villagers constructed fences with sticks and nets, to stop wild animals from entering the village. Animals trapped in the net, such as *Tragelaphus scriptus* (antelope) and *Galagidae* (bush baby or poto), were considered common property and would be cooked and eaten by the entire village. The sharing of bushmeat enhanced solidarity and unity within the community. The hunters added that each village had a hunting zone. Hunting was carried out around *Welie* (the last farms before the "black bush"). Following accounts from hunters in the villages, hunters' unions controlled access to the forest. The unions were made up mainly of male hunters, divided into subgroups and had rules and regulations respected by all. Members knew which subgroup and how many people were authorised to go into the forest. The union also conducted dancing rites for new hunters – such initiation dances were carried out at "eating spots" in the forest. Before embarking on a hunting trip, libation rites were performed, to ward off any potential dangers and to ensure a successful expedition. Each group had a hunting track prohibited to others; hunting along another group's path was punishable. These specific hunting trails and timings were initiated in order to avoid conflict, control hunting areas and reduce the indiscriminate killing of wildlife. In addition, after about six months, a forest area would be abandoned for some time and the hunters would move to another area, because they perceived that the noise of guns scared away animals. A group of hunters firmly expressed the following:

> *We conducted traditional rites [libation and dances] to ensure the continuous availability of wildlife, and we believed that hunting was orderly and sustainable, since we had particular paths and zones, and we could determine which animals were totems.*

In addition, the alteration of hunting zones was aimed at diminishing wildlife vulnerability and ensuring the continuous availability of bushmeat for consumption. Some selected members of the hunters' union were responsible for resolving conflicts. If a hunter was accused of collecting bushmeat from another person's trap, two people were normally sent to assess the issue. If the accused person was found guilty, he had to pay a fine worth the value of the bushmeat, and buy drinks for the inspection team. The hunters perceived that the way hunting was organised in the past was efficient and enhanced resilience and fauna conservation.

Totems

Wildlife management is also influenced by the belief in totems. According to local accounts from Bokwaongo and Mapanja, certain fauna species are preserved because of their spiritual significance, most remarkably chimpanzees -which provide authority and strength to individuals- and antelopes and duikers for their endurance and speed, respectively. Elephants, named "masters" are seen as totems from which the native people tap mystical powers for vengeance, battles and the traditional *Male* dance of the Bakweri people. The interviewees revered these fauna species, due to their vital spiritual and physical roles and how they relate to the community's prosperity. However, the respect for totems and the

customary role of *Male* have weakened, due to the creation of MCNP and the arrival of Christianity. As such, most people no longer believe in or fear totems, and they do not see them as contributing to community life. The respondents perceived that park creation has contributed to a decrease in the wildlife population and eroded traditional protective measures.

Land use and agriculture

Shifting cultivation was widely practiced in the past, as it helped the soil to regain its fertility. Depending on the individual farmer, a piece of land could be abandoned for more than ten years. The Indigenous People expressed no longer allowing land to fallow due to population growth, park creation and reduced land availability. Also, they do not farm in areas that provide specific environmental services, such as water catchments, shelterbelts or groves. The main crop planted and staple food for the native people was and is cocoyam, but today supplemented by yams, plantains and maize. Still, farming is mainly done for subsistence purposes and on a small scale, but some persons now grow cash crops such as banana, palms and commercially valuable medicinal plants such as *Prunus africana*. When farmers clear new areas for crops, they do not cut down important trees such as leguminous trees (e.g. *Albizia lebbeck*) and medicinal plants (e.g. *Prunus africana, Entandophragma angolense*). They believe that shifting cultivation protects the soil and boosts reforestation and biodiversity. The respondents complained that migration has brought in strangers who lack appropriate technical and cultural knowledge of local ecosystems. In general, shifting cultivation has greatly diminished because the government has actively discouraged it and has given local land to wealthier people and companies to establish banana, tea and palm plantations. Some interviewees added that the government is ignorant of the fact that plantations severely damage the environment.

6. Discussion

6.1 Traditional institutions and resource management

Natural resources are indispensable to the well-being of indigenous communities. Avoiding ecological loss and protecting forest resources in these societies was realised through traditional institutional regimes. In the Mount Cameroon region, the traditional authority held by elders played a vital role in biodiversity conservation and enhancing local livelihoods. Particularly, fauna (*Loxodonta, Pan troglodytes, Tragelaphus scriptus, Galagidae*) and flora (*Raphia hookeri, Cordia millenii*) species were believed to be sacred and as a result under customary protection. Traditional regulations on forest resource management were respected, and these were achieved through fines, forest committees and the enforcement of village settlement patterns, as well as by ensuring strict respect for totems, sacred sites and shrines. Therefore, biodiversity conservation was safeguarded by enforcing sustainable principles and sanctions. Traditional forest committees operating within local councils were in charge of forest protection and guaranteed that rules regarding natural resource exploitation were respected. Presently, park management have created VFMCs, perceived by the respondents to be politically-driven, inefficient, unrepresentative and conflicting with the local council and the local population. Kemmler and Baumgart (2014) and Fadhilia

et al. (2016) describe that conventional forest management regimes and practices frequently undermine the survival of native people, occasioning conflicts, tension and disregard for customary laws. The creation of the VFMCs is ironic, and its role in forest conservation is not new, because Indigenous People since time immemorial have had forest committees with similar functions.

Preserving the natural environment is a major concern for local stakeholders and institutions. Traditional councils provided limitations on where and which trees could be used (Shemdoe 2017). Respect for utilisation rules was ensured through fines (financial, material) levied on defaulters. Moreover, traditional councils provided conservation education by encouraging the local population to plant trees, particularly those important for construction, firewood and traditional medicines. Their emphasis that villagers should use trees, collect medicinal plants and carry out hunting from farm and communal lands, and not from the "black bush" (secondary forests and protected areas) and areas were shrines are found, was a major conservation effort. Thus, the "conservation" and "territorialisation" of forest areas are not new concepts introduced by the West, since Indigenous People have employed such practices for many years. What is new, however, are formal regulations and conservation measures put in place by the state. Similarly, to further the sustainability of fauna, hunters used to apply rotatory hunting, governance and control mechanisms such as taboos, fines, libations and the division of hunters into subgroups. Today, the indigenous hunters revealed that the shift in forest ownership from the community to the state, aligned with the subsequent reinforcement of control, has created more harm to wildlife species. State agents (forest guards) do not have a mastery of the forest environment and control is not regular, which gives room for illegal activities and unsustainable use of resources. This shows that the territorialisation of forests and the application of new management regimes raise pertinent questions about control, sustainability and access (Schmidt 2012).

Biodiversity conservation using indigenous knowledge

The livelihoods and sustainable use of resources by Indigenous People are influenced by their reverence for shrines and sacred spots. Some fauna and flora species are protected, since people are not allowed to hunt, exploit trees or indiscriminately visit these areas. The sacredness of shrines and libation spots allows for the protection of natural gifts from deforestation, bushfires and destruction. Other studies in Cameroon also document the role and effectiveness of local customs, taboos and beliefs in environmental management and local conservation (Fongod et al. 2014; Kemeuze et al. 2016; Ajonina et al. 2017). The importance of sacred places, taboos and shrines to indigenous livelihoods and environments implies that they have to be considered in policies and strategies geared towards environmental protection.

The Indigenous People's narratives reflect the notion that non-indigenes are not allowed to harvest medicinal plants, which in turn helps to avoid extinction and safeguard sustainability and efficiency during treatment, thereby depicting an association between the traditional health care belief system and environmental protection. They treat the natural environment and its bounty with respect and ensure a continuous harvest guided by environmental ideologies in the light of adaptive actions for controlling, improving and

maintaining medicinal plants. The selective harvesting of plant leaves and sections of trees reveals that the population understand that unsustainable harvesting will affect a tree's capacity to regenerate and reproduce.

7. Conclusion

This study explores indigenous knowledge and biodiversity conservation in the Mount Cameroon region. It shows that local people employ several approaches to ensuring a continuous flow of forest goods and services, protecting the natural environment and regulating use. Moreover, traditional ways of protecting the environment and farming are effective and respected by the local population. Besides, the decrease in biodiversity, changes in soil quality and deforestation are due to the erosion and weakening of traditional knowledge and institutions. These features are essential to the collaborative management of protected areas. Nevertheless, indigenous practices do have some pitfalls; for instance, hunting was carried out using wire traps, which killed animals indiscriminately. As other studies elsewhere, our study points to the need to merge traditional and modern practices to protect the environment, instead of imposing foreign approaches with knock-on effects on the local population and the environment. We believe that research documenting the critical importance of indigenous knowledge systems and expertise in forest-dependent communities is the first step to valorising and incorporating all knowledge regimes for efficient resource management.
Supplemental data for this article can be accessed on the publisher's website

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