Impact of Aboriginal Belief Systems on Natural Resources Management: Mount Cameroon National Park (MCNP)

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Abstract:
Limited research exist on the effect of beliefs systems on management of the natural resources especially in Africa. Past decades has experienced efforts made by NGOs, IGOs, Aboriginal people and government to facilitate an effective mechanism to collaboratively manage the forest resources. Nonetheless, a biodiversity hotspot is still being threatened and the collaborative management is 'pretentious' in MCNP. This research argues that, unless the complexities and dynamics of the belief and indigenous knowledge are understood and the incorporated into management of natural resources management, collaborative and sustainable management is impractical on MCNP. Sample selection was done using EpiInfo 6.04d (CDC, 2001). We use survey of 238 household randomly selected from 14 of the 41 villages in MCNP (487 questionnaires), focused group discussions, key informant interviews and participant observations were used to collect data. Secondary data was obtained from the Ministry of forestry and Wildlife and also from park management. We find significant evidence (67%) that native beliefs which affect resource management exist in all the four clusters in MCNP. The rural area of Bomboko cluster are more prominent in practicing beliefs 78.3% followed by the Buea cluster with 62.5%. Only 18.5% confirmed that management observed beliefs. A majority of the people (89.5%) perceived that degradation of natural resources is as a result of disregard of native beliefs. Traditional forest conservation was practiced in areas that have traditional beliefs associated with forest resources P<0.001. Spearman's Rho showed significant relationship between perceived traditional importance of forest and perceived importance of collaborative forest management. Focused group discussions disclosed dissatisfaction in management especially from the hunters and also exposed a momentous decline in the use of the bakweri language which has caused the erosion of culture and indigenous knowledge. We recommend empowerment of local people and integration of cultural beliefs and indigenous knowledge as well as active involvement of the aboriginal people in management and decision making of natural resources in MCNP.
Keywords: Cultural beliefs, collaborative management, national parks, indigenous knowledge, natural resources management.

1.1   Introduction

Africa like most developing countries has some of the most resourceful tropical rainforest which are a centre for high biological diversity and endemism. These forests are homes to millions of people who, are rich in forest knowledge and extractive skill but poor in income and assets (Byron and Arnold, 1999, Sunderlin et al., 2003), this aspect has retarded the efficacy of resources management in Africa and most developing countries. When rainforest was recognised as an avenue for local people to enhance their livelihoods it sparked up some international conservation–development' initiatives during the 1980s and 1990s intended at both protecting the forest and alleviating poverty of rural population (Pattanayak and Sills, 2001, McSweeney, 2002, Coomes et al., 2004, Gerhardinger et al., 2009). Despite enormous investments to promote conservation by NGOs, conservation donors and even community members and groups, the situation with forest management has not changed because the indigenous people who are carriers of the knowledge of the areas are being relegated. Amungwa (2011), did well in concluding that management organisms neglect indigenous systems of communities which has been detrimental to natural resources management.

Nature conservation is gradually being aware of the need to involve the local people in decision making but are not willing to accept the importance of the local people and integrate them in decision making. Most conservation agencies, governments and NGOs hardly value the indigenous knowledge and traditional beliefs of the local people. Research has established that communities of natural resources users can play important roles in natural resources management,(Cinner and Aswani, 2007, Shahabuddin and Rao, 2010). This is why the

relationship between spirituality and resource management has received enormous attention lately. This includes the International Union of Concerned Scientists (IUCN) group on Cultural and Spiritual Values,   the World Wildlife Fund (WWF) program on Faith and Conservation, and the Yale Form on Religion and Ecology. These programs all stressed the importance of spiritual and non-material values in influencing environmental outcomes. There has been a significant amount of research done that has established the positive effects that religion can have on natural resource outcomes (Lebbie and Guries, 1995, Khurnbongmayum et al., 2005, Bhagwat and Rutte, 2006). These values has been quite active in India and Asia but the spirituality and culture are all losing their grip in Sub-Saharan Africa where there is need to resuscitate these beliefs to enhance environmental management and livelihoods of the local people.

Mount Cameroon National Park (MCNP) has 41 communities living around the park with over 400 000 people, management is a challenge. Efforts have been made to involve the aboriginal people through collaboration (sensitizations, setting-up of village forest development committees VFMC and cluster platform meetings, among others, by park management and partners) but always ends up with aboriginal people protecting their personal interest due to cultural ties and environmental dependence. The use of belief system has not been investigated as an avenue for sustainable natural resources management. Mount Cameroon which is popularly known as 'Chariots of the gods,' has beliefs and traditions which might influence resource management and needs to be investigated. The indigenes are grounded by the beliefs of the area and also have a wealth of indigenous knowledge which can serve as base for the sustainable management of natural resources in MCNP. Each area has peculiar beliefs and culture which if disregarded can cause an adverse effect to the people's livelihoods and management of the natural resources (Norgaard, 2006, Simons, 2013).

This research argues that the MCNP can establish a strong and sustainable management plan if the authorities concerned will adhere to the beliefs, empower indigenous people and involve existing indigenous groups around MCNP in the management process. We investigate the existence of beliefs around the MCNP to know if these beliefs are still adhered to by the people and observed by the management. We correlated beliefs, traditional resources management and collaborative management strategies to ascertain effectiveness of management of the MCNP.

1.2   Background of the study

Cultural values play significant role in understanding the importance of natural resources of people around protected areas and spiritually enriching values attached to land and wild natural resources can very well determined how people will use these resources (Cocks and Dold, 2006, Pretty et al., 2006, Thondhlana and Shackleton, 2013). Empirical studies has shown how the indigenous knowledge of traditional medicinal value has sustained health in the widest sense of physical, spiritual social and psychological well-being and protected people from witchcrafts (Byers et al., 2001, Dugmore and Van Wyk, 2008, Shackleton and Gumbo, 2010, Thondhlana and Shackleton, 2013). These indigenous knowledge which include (myths, taboos, beliefs, and normative ways of harvestings specific plants) accumulate over thousands of years and are usually encoded in the routine cultural practice of the people (Colding and Folke, 1997, Colding and Folke, 2000, Berkes et al., 2000, Moller et al., 2003, Kanoswski and Williams, 2009, Kideghesho and Msuya, 2010). Beliefs can be defined as mental and verbal ideas and assessments we have and we make about the world we inhabit; they will be of varying strengths. A good example of skilled knowledge of indigenous people is the conservation of fish by the *ribeirinhos* of the lower Brazilian Amazon who for many years have used their indigenous knowledge to conserve fish (Harris, 2005). There is a similar situation in Bolivia where the Quecha farmers of semi-arid Apillapampa use their indigenous expert knowledge to conserve important medicinal plants (Thomas et al., 2009). The indigenous knowledge, which is now dwindling, of the Waorani people of the Ecuadorian Amazon has helped them recuperate depleted soil nutrients and other natural resources in their area (Lu, 2001, Gray et al., 2008). The significance of indigenous knowledge cannot be over emphasised since it is enshrined in their daily cultural beliefs and practices which is an under-utilized assert to natural resources management. The transmission of this knowledge of the use and non-use value of fauna and flora species are necessary elements of culture that ensures conservation of natural resources (Palmer et al., 2004).

The way cultural values are fashioned establishes the structure through which natural resources management is perceived, ranked and disputed by the local communities (Crane, 2010). It becomes incumbent therefore for every government to elevate the importance of culture in order to achieve efficacy in natural resources management. Thondhlana and Shackleton (2013), illustrate that though cultural values are inseparably linked to resource use, they are not recognised by all community members. Cultural values arise from a diverse and sometimes conflicting array of values that interrupts individuals' lifestyles. This explains why understanding of context-specific cultural settings and the linkages between the cultural and material dimensions of resource use can lead to the development of interventions that can ensure effective and sustainable conservation of both natural resources and culture. High resources demand has been known to weaken the indigenous knowledge systems and the control they have over resources use showing that culture is not static but evolves over time to

suit many circumstances, and beliefs are mostly uniform not across groups (Bremner and Lu, 2006, Pretty et al., 2006, Thondhlana et al., 2012).

There is need to find possible ways to compromise resources conservation and cultural enhancement to avoid environmental degradation and erosion of culture. The World Bank (2001) and FAO (2005) are anticipating that forest could be a major source of poverty reduction by 2015 (Wunder, 2001, Sunderlin et al., 2005, Angelsen and Wunder, 2003). In order for forest to be able to help the poor there is need to understand how the community interact with the resources and the part played by every aspect in the interaction process. As Barry Commoner rightly put it "everything is connected to everything else" (Commoner, 1996, Commoner, 2014). The biodiversity of the MCNP is increasingly being threatened and the culture is eroded because of the unwillingness to understand the complexities of the indigenous communities. This study takes the initiative to investigate the existence of a relationship between culture and natural resources management that can salvage the present situation.

1.3   Method of Study
1.3.1   Study Site
Cameroon has a total area of 475,442 km² from the Atlantic Ocean to Lake Chad, lies between latitude 2° and 13° north of the equator and longitudes 8°30′ and 16°10′ east of the Greenwich Meridian (Abbot et al., 2001). The country is located in the heart of Central Africa. It has borders with Equatorial Guinea, Gabon and Congo to the south, the Central African Republic and Chad to the East and Nigeria to the West. The population of Cameroon is estimated at 16 million with an average population density of 32 persons per km². The country has more than 250 tribes of the Bantu and semi Bantu speaking origin apart from the pygmies in southern equatorial forest (Fanso, 1989). In Cameroon humid forest zone covers 270, 162km² which is about 58% of the total land surface (Ndoye and Kaimowitz, 2000). This rate of forest cover loss in the humid tropics of Cameroon is one of the highest in Central Africa (Sunderlin et al., 2000). Annual deforestation in Cameroon is estimated to range between 80 000 to 200 000 ha² (Ndoye and Kaimowitz, 2000), or 0.4–1.0% of forest cover. Awono et al. (2014), show that deforestation is higher in the South West Region where MCNP is located.
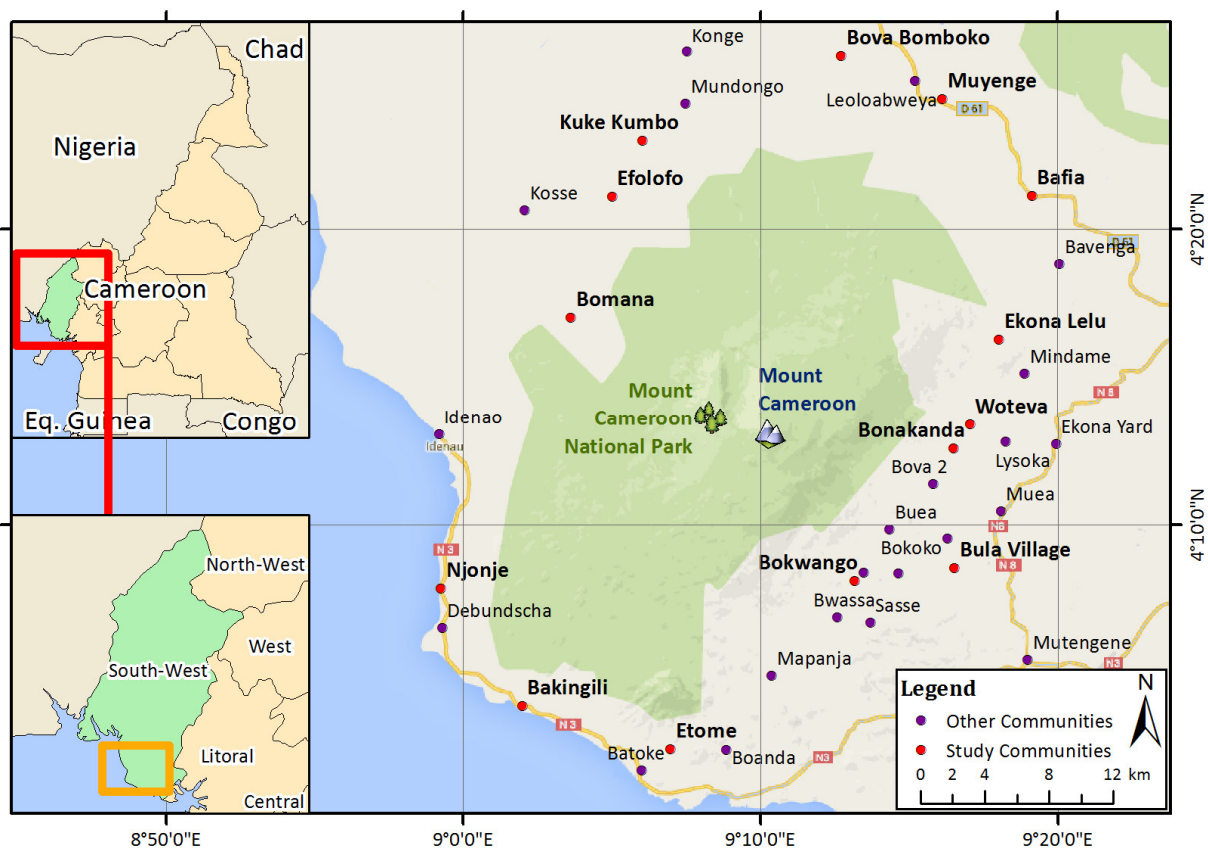
Figure 1 Map of Cameroon showing the Study Area

The MCNP is found in the Southwest Region of Cameroon covering an area of 58, 178 ha. The Park which was established by Prime Ministerial degree N0. 2009/PM of 18 December 2009, is a biodiversity hotspot hosting many endemic plants and animal species (Brooks et al., 2002). Over 400,000 people live around MCNP

the natural resources in the area is exposed to over exploitation (Wanji et al., 2003). The climate is humid and tropical in the south and dry in the north. The rate of precipitation reduces as one move northwards. The different climatic patterns has favoured the development of great rivers (Sanaga, Wouri, Nyong, Manyu) flowing through luxuriant, dense forests that provide a habitat for a multitude of plant and animal species. Cameroon's main exports are crude oil and petroleum products, timber, cocoa, coffee and cotton.

1.3.2   Study Design

The study used the mixed methods approach, quantitative and qualitative, stems from the recognition that no research method is free from limitation and that biases in one method could potentially be checked by other methods (Johnson and Onwuegbuzie, 2004, Creswell, 2013).

1.3.3   Sampling, Data Collection and Analysis

Both secondary and primary data was obtained for the study from July 2013-March 2014. Sample selection was done using EpiInfo 6.04d (CDC, 2001). Secondary data from forestry included records of villages from agro-ecological survey, forestry instruments used in governing natural resources and village sensitization reports. Fourteen villages were selected, purposively, from the 41 villages around the park to represent the sample needed for the study. One of the villages for each cluster had to be near the park (<8km) and the others far from the park boundary (>12km). Households were randomly selected from the 14 villages with a minimum of 29 household per village. Women were interviewed to get the female (42.5%) viewpoints of beliefs and resources management. Snowball sampling strategy was used to identify key informants. Community survey, semi-structured questionnaires, focused group discussion, key informant interviews and participant observations were all used as instruments for data collection. Villagers, NGOs, government organization and other civil societies organizations where interviewed.

1.3.4   Data entry and analysis:

Data was entered using EpiData Version 3.1 (Lauritsen, 2013) and analysed using the Statistical Package for Social Sciences (SPSS) Standard version, Release 17.0 **(Statistics, 2008).**

1.3.5 Data analysis

Data was analysed using descriptive statistics to present the distribution of subjects between and within subsets using frequencies and proportions, and more specifically Multiple Response Analysis (MRA) for multiple responses questions with possibility for the respondent to select more than one response (Nishisato, 2014). Relationship between conceptual indicators and background indicators for categorical variables was appraised using Chi-Square test of independence/equality of proportion while the non-parametric Spearman's Rho correlation test was used to assess strength and direction of relationship of variables that though subjective could be polarized (Commission, 2008). Results were presented using statistical tables, charts and code-quotation-grounding report for thematic analysis and conceptual diagram. All statistics were discussed at the 0.05 significant level (α=0.05). Whenever, the P-value was less than Alpha, the significant relationship, P-values =0.000 were mathematically represented as P<0.001. Transcriptions of the interviews were analysed according to the principles of grounded theory described (Strauss and Corbin, 1990), using open and axial coding. The development index score was computed by summing educational level, income, and ability to take care of family health, children education, feeding and other assets like farm, animals, TV, car, land or house. Development index score was then contextually ranked by sharing into 4 ranges using the quartiles cut points.

1.4   Results and discussions:

1.4.1   Profile of respondent:

In the sample size of 487 respondent there were 57.5% males and 42.5% females were more occupied with household responsibilities. The ages of respondent from 25-45 was 51.1% and 42% were 46+. Based on setting type, 58.9% rural and 41.1% semi-urban; 86.5% respondents were farmers, 25% were housewives and the rest were hunters, fishermen, and workers. Educational criteria had (50.9%) primary while 20.9% had no formal education. Only 28% had more than primary education. Findings showed 74.7% respondents were married, 92.5% Christians and 7.5% traditionalist. Explains why Christianity was blamed for overtaking tradition. The income status of respondent was not encouraging as 37% made less than 30. 000 FRS a month, 39.8% made 30, 000-100 000 FRS while only 6.8% made over 100.000FRS.

1.4.2   Development Index:

It was realized that development index varied significantly among the various clusters (χ2-test: χ2=55.150; df=9; P<0.001) with West Coast having the highest proportion of those with very high development index 26 (34.2%) followed by Buea while Bomboko had the highest proportion of respondents with low development index 36 (37.1%), followed by Muyuka 34 (33.7%). In overall, roughly half of the sampled population had development index average or low 185 (50.4%).

1.4.3   Availability of beliefs associated to forest resources in MCNP

The *Bakwerians* are the indigenes in the villages around MCNP, however due to the fertile nature of the soils many other tribes have moved into increase the population of the area putting pressure on the natural resources.

Findings show that the aboriginal Bakweri people have beliefs and traditions around the MCNP which affect the natural resources. The Mount Cameroon which is popularly known as 'the chariots of the gods' is the home for the god of the people of the bakweri clan known as the '*ihvarza mote*' (half-man). Empirical studies elucidates belief in the gods and traditional practices related to this god of the area. Majority of the people in the study (67%) agree that there are beliefs associated to the resources of MCNP figure 1.
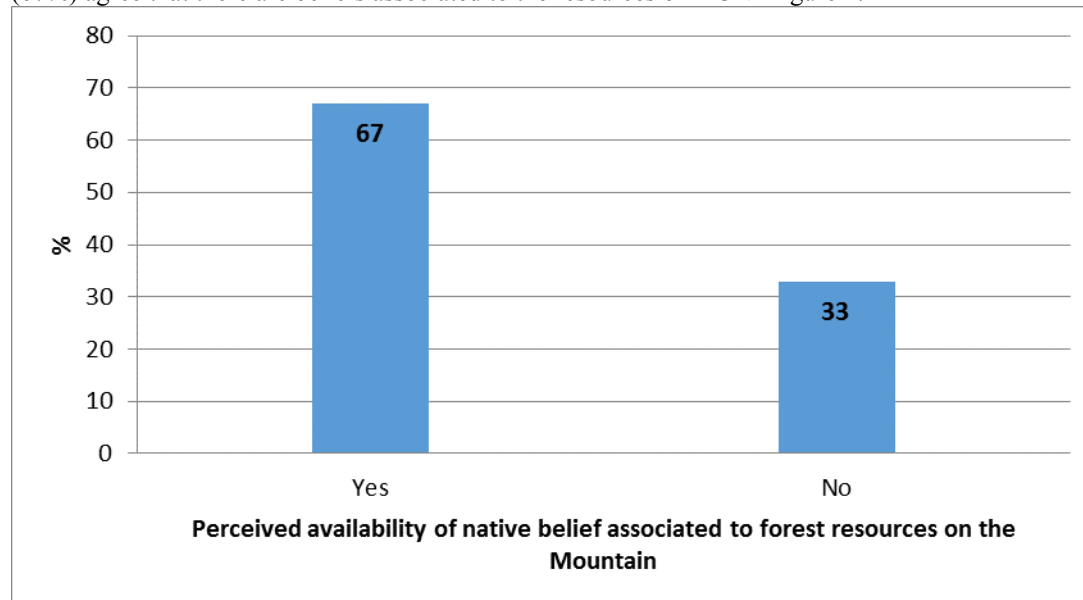
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Figure 2: Perceived availability of native belief associated to forest resources on Mount Cameroon
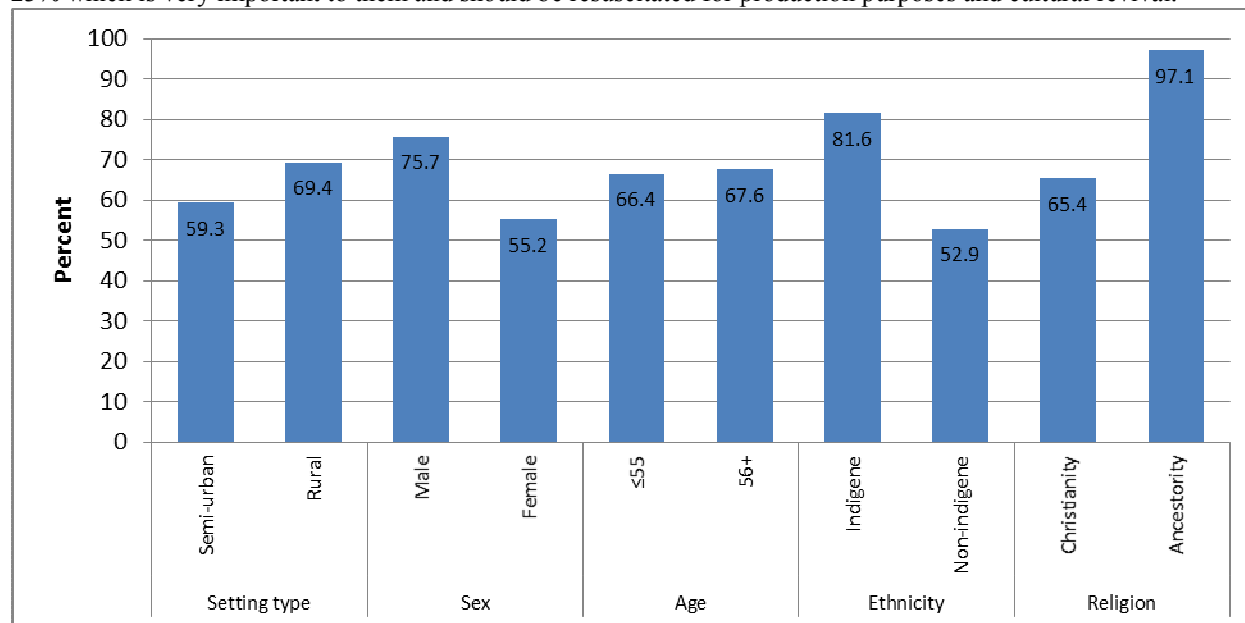
Table 1: Perceived availability of native belief associated to forest resources on Mount Cameroon: distribution by clusters

Sub-division of residence		Do you have any native belief associated to forest resources on the Mountain?		Total
		Yes	**No**	
Bomboko	n	101	28	129
	%	78.3%	21.7%	100.0%
Buea	n	75	40	115
	%	65.2%	34.8%	100.0%
Muyuka	n	80	48	128
	%	62.5%	37.5%	100.0%
West Coast	n	58	39	97
	%	59.8%	40.2%	100.0%
Total	n	314	155	469
	%	67.0%	33.0%	100.0%

$\chi 2=11.050$; df=3; P=0.011.

There was strong evidence that native beliefs exist in all the clusters and that they were associated with forest resources on the Mount Cameroon 314 (67.0%), figure 1. The implantation of these beliefs varied among the various clusters. They were most represented in Bomboko 101 (78.3%) and the least in West Coast 58 (59.8%), table 1. There was statistically enough evidence that these beliefs were more present in some communities than others ($\chi 2=92.612$; df=13; P<0.001); as was the case in Kuke Kumbu 33 (100.0%), Ekona Lelu 31 (96.9%) and Efolofo 29 (96.7%) while it went below 50% in Bafia and Bakingili that are highly cosmopolitan. The existence of these beliefs was significantly higher in rural area, among the male and among the indigenes but not related with age, figure 3. It was realized that indigenous belief associated to forest resources on Mount Cameroon were not necessarily related to distance from the park as weights are distributed at random across the various distance without any consistent trend but more to the characteristics of individual communities. This indicator was not associated with neither income nor educational level ($\chi 2$-test: P>0.05). It

was also noticed that 97.1% of those who practiced ancestral religion (worshiping their ancestors) are those who upheld to the beliefs. The indigenous practiced traditional beliefs more than the non-indigenes 81.6% and 52.9% respectively. The majority of the people are convinced that these beliefs protect the land 67% and heal the land 23% which is very important to them and should be resuscitated for production purposes and cultural revival.

N=469

Figure 3: Perceived availability of native belief associated to forest resources on the Mountain: distribution by setting type

Setting type: χ2=3.947; df=1; P=0.047; Sex: χ2=21.862; df=1; P<0.001; Age: χ2=0.079; df=1; P=0.779; Ethnicity: χ2=42.003; df=1; P<0.001; Religion: χ2=14.927; df=1; P<0.001

The discussions from FGDs showed that these beliefs are all related. The gods of the mountain '*ihvarza mote*' is the one who protect all the forest while these others are group of people to do cleansing "*tanize*" to enable the land produce again. They believed that the poor production and loss of biodiversity are all connected to the anger of the gods of the mountain. In the event of showing his anger there will be an earth tremor, volcanic eruption and lava flow. The last flow was believed to be out of the anger of the gods shown as warning sign "Lava from gods as warning if angry" or destruction of properties. To calm down the flow libation will be done by elders and chiefs (who also are members of *nganya* and *maley*) at the *Navico* (a sacred stony, cloudy and deep hole) to appease the gods and obtain calmness.

### 1.4.4   Impact of Beliefs on livelihoods and Resources Management

These findings agree with focused group discussion which explained the significance of these beliefs in community enhancement and wellbeing. Most communities mentioned that the disregard of the local people and their beliefs is detrimental to the management of the natural resources. "The god '*ihvarza mote*' (half-man) cannot be happy", they said. The hunters particularly expressed their dissatisfaction in the management process. "They have destroyed our huts on the Mountain. We can still stay in caves when we go hunting. They don't care how we survive or send our kids to school". In a meeting with the hunters they expressed their grievances, "hunting is father to son, all we know is hunting yet we are asked to withdraw without given an alternative. Stealing has increased because of this". It was evident that these hunters have certainly not withdrawn from their hunting activities. Although the quantitative results did not show that hunting is their primary occupation they were still engaged in hunting alongside farming. "We have reduced hunting activities", they said "but we cannot stop, they need to have a meeting with us and engage us in something that can give us real income to take care of our families, even the Spirits, '*elinge*' is backing us", one of them said. [Name Withheld] They argued in FGDs that they have to do their hunting unless an alternative was given to them and they have ways 'spiritually' to do without being seen. Hunting is one subject that sparks heated argument of moral assessment. As Anke Fischer et al. (2013) records it these moral argument are necessary for legitimation and de-legitimation of hunting practices. To enable a sustainable management plan in MCNP, the views of hunters must be considered.

Recent studies by Bennett and Dearden (2014) revealed agitations by Mu Koh Surin people of marine protected areas MPA in Thaiwan when they were deprived from the traditional Moken community from fishing and harvesting in the area without providing other livelihoods options. This shows that despite efforts of co-management by forestry and technical partners, there is need to incorporate the beliefs and involve some traditional groups in the management process. The development index shows that people are leaving in very hard

conditions lacking basic necessities like water, toilets, roads and their food products which they could sell to augment their income is bought at low cost due to bad roads and no market competition (buyers set the prices).

To supplement their livelihood they have to do many things to earn a leaving including harvesting forest and NTFP. Some timber species extracted from the forest include: Mahogany (*Khaya sp* and *Entandrophragma sp)*, Obeche (*Triplochiton scleroxylon*), Iroko (*Chlorophora excelsa*), Black Afara (*Terminalia ivorensis)*, White Afara (*T. superba*), Small Leaf (*Pterygota sp*) and Kandang (*Pycnanthus angolensis*. Common NTFPs in the area are Njangsang (*Recinodendron heudeloti),* Eru (*Gnetum africanum),* Bush mango (*Irvingia gabonensis), (I. Wombolo),* Bush pepper (*Piper guinensis),* Cola nut (*Cola accuminata; C.nitida),* Bitter cola (*Garcinia kola),* Rattan (*Laccorsperma spp. Eremospatha spp*) and Raffia (Raphia *hookeri)* which are mostly done by women and children. The common wildlife species include the Primates: Putty Nose Monkey (*Cercopithecus nictitans nictitans*); Red Ear Guenon (*C. erythrotis*); Mona Monkey (*C. mona mona*) and Chimpanzee (*Pan troglodytes*). There are also large mammals like the Blue Duiker (*C. monticola*); Ogilby's Duiker (*Cephalophus ogilbyi*) and the Elephant (*Loxodonta africana*) in the area close to and in the Park. Species commonly seen and sometimes hunted include Porcupine (*Atherurus africanus*), Giant Rats (*Cricetomys gambianus*); Grass Cutter (*Thryonomys swinderianus)*, Bay Duiker (*Cephalophus dorsalis)*, Ogilbys Duiker, Blue Duiker, Ornate Monitor Lizard, Pangolin (*Smutsia gigante* and *Uromanis tetradactyla*) as well as a variety of bird species like the Mount Cameroon Francolin, (*Turacos, Hornbills*).

1.4.5   *Perceived importance of forest in relation to belief system*
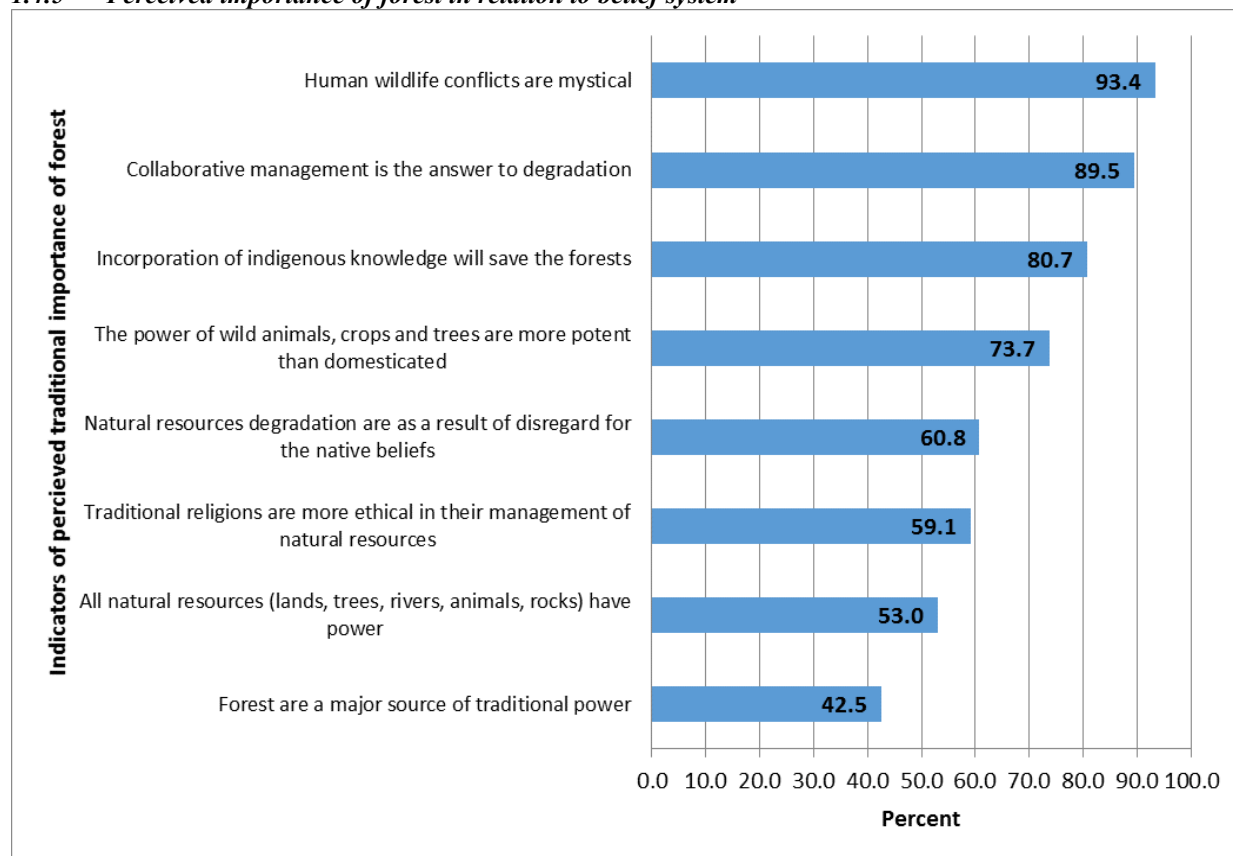
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Figure 4: Perceived importance of forest in relation to belief system around MCNP

Dominantly, communities around MCNP believe that the degradation of natural resources is as a result of disregard of the native beliefs (figure 4) as these beliefs generally call for protected areas and respect for natural resources as rituals and libation shall be performed before felling a tree. Harvesting trees or animal and the purpose for the harvesting shall be well clarified during the libation. Six indicators out of seven strongly support this perspective as their weight are exceeded 50% and at the same time, the idea of co-management was supported by 436 (89.5%).

The fear of the gods at first caused people to ration the harvesting of the resources. People harvested what was needed. Violation will attract punishment from God *lohwa*. For instance, it was believed that taking a long wood out of the forest was a violation and doing so will cause a swollen stomach to the violator until cleaning or *tanirze* was done. People are not allowed to take fruits out of the mountain, they could eat as much as they can but if they try taking out they will not find their way out, and there were very diverse fruits to explore.

There are areas like *Navico,* a very deep cloudy stony hole where natives can actually do libations to stop a deadly lava flow that persist. The myth behind this area is completely known by hunters and some very elderly people who will soon die with this knowledge. They refused to tell it all but according to them they have words in bakweri they will say and the cloudy hole will produce cloud. Hunters make themselves invisible to Eco-guards. Formally sacrifices 'yawo *yaawo'* were done using albinos or *moongo* as is called in the bakweri dialect, to appease the gods of the land, however there are other offerings used instead of the *moongo* presently. The *mooka mo maley* is a sacred place used by the *Maley* people to do cleaning that will enable refreshment of the land and the *ekoloko la maley* was used to control conflicts in the land. As the people explained all these issues where highly considered in resource conservation and violations were difficult and will attract punishment from the gods. In the event of a conflict the *ekoloko la maley* will set up an injunction order until situation was resolved.

The majority of the people believed that human wildlife conflicts are mystical. They explained that the elephant especially where used to in destruction to express anger of the gods or an exceptional event that was to happen. They strongly believed this is still the case as they explained a recent case of elephant destruction in the Bokwaongo village at the event of the death of a chief and a member of the elephant dance group. These associations can no longer be ignored as it plays a major role not only in the psychology of the people but also in natural resource management.

1.4.6 *Practice of traditional forest conservation*

Activities that could be related to traditional forest conservation was asserted by 170 (36.2%) respondent and included swearing of traditional gods (16.0%), creation of sacred forest (15%) and other methods (3%) that included avoiding the burning of trees or farms, creation of shrine and reforestation (figure 5). A good share (66%) said that traditional forest conservation is not practiced and the reasons given were too many people from other communities also harvest these products (58%), no legal access to the forest (11%), cultural practices have been undermined by administration (24%) and lack of incentive from administration (7%). Dominantly, they practiced traditional forest conservation was done because forests served as a home for ancestral gods (47%). consistency could be observed in the responses as the 24% that highlighted disregard of cultural values by the administration matches with the 27% who asserted the lack of traditional forest conservation (figure 5).
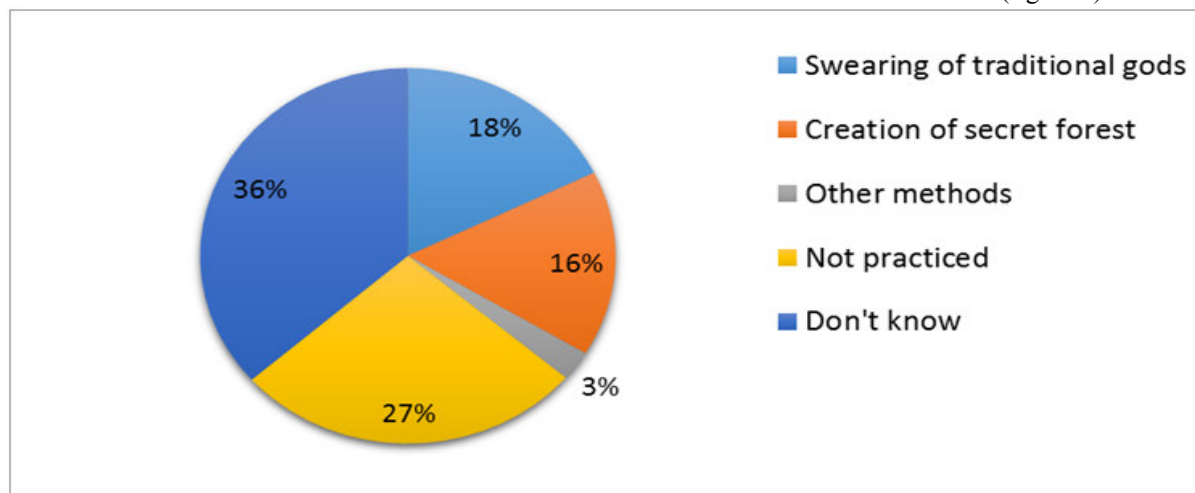
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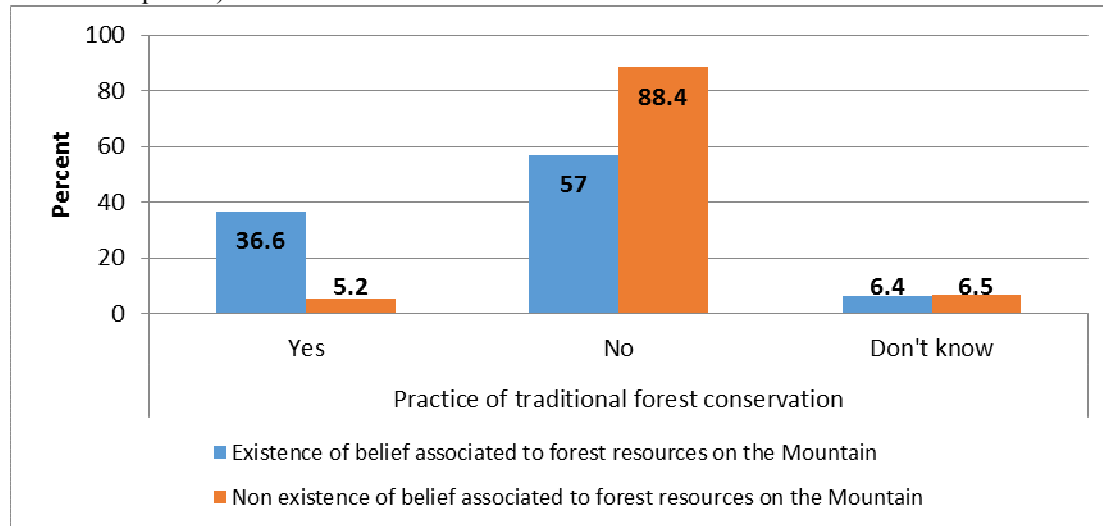**Figure 5: Practice of traditional forest conservation**

Table 2: Distribution of practice of traditional forest conservation by existence of belief and cluster

Cluster/sub-division	Existence traditional belief system		χ2-test
	Yes	No	
Bomboko	69 (68.3%) 101	5 (17.9%) 28	χ2=39.620; df=2; P<0.001
Buea	13 (17.3% 75	2 (5.0%) 40	χ2=7.670; df=2; P=0.006
Muyuka	22 (27.5%) 80	1 (2.1%) 48	χ2=16.526; df=2; P<0.001
West Coast	11 (19.0%) 58	0 (0.0%) 39	χ2=10.887; df=2; P=0.004
Total	115 (36.6%) 314	8 (5.2%) 155	χ2=54.338; df=2; P<0.001

1.4.7   *Relationship between traditional belief and practice of forest conservation*

It was realized that traditional forest conservation was practiced more in areas where there exist traditional belief associated to forest resources with rate 115 (36.6%) against a significantly ($\chi2=54.338$; df=2; P<0.001) lower rate where there was no belief associated to forest resources 8 (5.2%), figure 6. This trend was verified in the various clusters ($\chi2$-test= P<0.005) but the least pronounced was Buea 13 (17.3%) and the most pronounce in Bomboko 69 (68.3%), table 6 and existence of beliefs associated to forest resources was the highest 101 (78.3%) in this community as well. Practiced of traditional forest conservation was significantly associated with setting type, religion, sub-division and level of dependence on forest resources (estimated based on the number of resources exploited).

$\chi2=54.338$; df=2; P<0.001

Figure 6: Relationship between belief and practice of traditional forest conservation

From all indications it was clear that the bakweri clan has a strong connection with the montane elephants, *Loxodota Africana* known as *njoku*. It is believed that some people transform into elephants and operate in the forest. This made them protect the specie, but as the tradition is dying the specie is getting scarce on the mountain. One woman said, "Gone are the days when elephants '*njoku*' were living with people, all was well. The chief passed orders and things happened based on his orders. The gods are angry and the elephants are far from us, which is why all is going wrong. The land need cleansing '*tanirze*' to make things right with the gods, she said. The *Maley* group, which is the elephant dance, is meant to portray the powers behind the elephants '*njoku*' over the area and the people. The *Nganya* dance (by men) was also used to cleanse the area and appease the gods, the young females are not allowed to see the *moseke* masquerade or they get barren. The older women danced *malowa* naked late at night to accompany the males in the cleansing or '*tanirze*' process. After these cleansing the production of land will increase and the women will become fertile.

Plate 1 Elephant dance in a village around MCNP

"These are the issues which made the place productive and people feared the gods, now Christianity has taken over and there is no fear of nature and the gods anymore, even the '*magic stick*' on the mountain was cut down without fear. There is need to appease the gods and to incorporate beliefs of this area into natural resources management", said one old man. "We have abandoned our *mooka/ikuma* or shrines that is why all is going wrong. The power '*nginya*' given to us by the gods are not as they should be because the beliefs of the people

are relegated, this is not correct. God '*Lohwa*' who gave these people the land knows why he allowed them to maintain these beliefs, therefore, should be used in the management process". [Name withheld] It was evident from the studies that all the villages selected had shrine '*mooka*' as is common with the bakweri tradition. It is here that libations are done to appease the gods of the land so that plants, animals and man will be productive and live in harmony.

Table 3: Relationship between perceived importance of forest and perceived need for collaborative forest management

Independent variables	Dependent variable: collaborative forest management	
	Spearman's' Rho	**N**
Forest are a major source of traditional power	R=0.221** P<0.001	487
All natural resources (lands, trees, rivers, animals, rocks) have power	R=0.169** P<0.001	487
Traditional religions are more ethical in their management of natural resource	R=0.309** P<0.001	487
Natural resources degradation are as a result of disregard for the native belief	R=0.321** P<0.001	487
The power of wild animals, crops and trees are more potent than domesticated	R=0.311** P<0.001	487
Incorporation of indigenous knowledge will save the forests	R=0.284** P<0.001	487
Human wild life conflict are mystical	R=0.037** P=0.421	487
Sum of score perceived importance of forest	R= 0.454** P< 0.001.	

1.4.8   Influence of belief system on the management of resources on MCNP

There is a significant association between perceived traditional importance of forest and perceived importance of collaborative forest management as well as traditional forest management, those who believed in traditional forest management endorsed the idea of collaborative forest management (Spearman's Rho: R= 0.140; P= -0.002; N=487) and vice versa (table 3). The conceptual diagram (figure 7) summarizes the influence of traditional belief on the management of MCNP. In a nutshell, though traditional beliefs associated with resources still existed, their effect on the management of MCNP was weak as seriously hindered by number of limiting factors. Focused group discussion also confirmed that management does not give way for traditional forest conservation to prevail through beliefs systems. Nonetheless, there is need to understand how to use this to secure sustainable management of the natural resources.
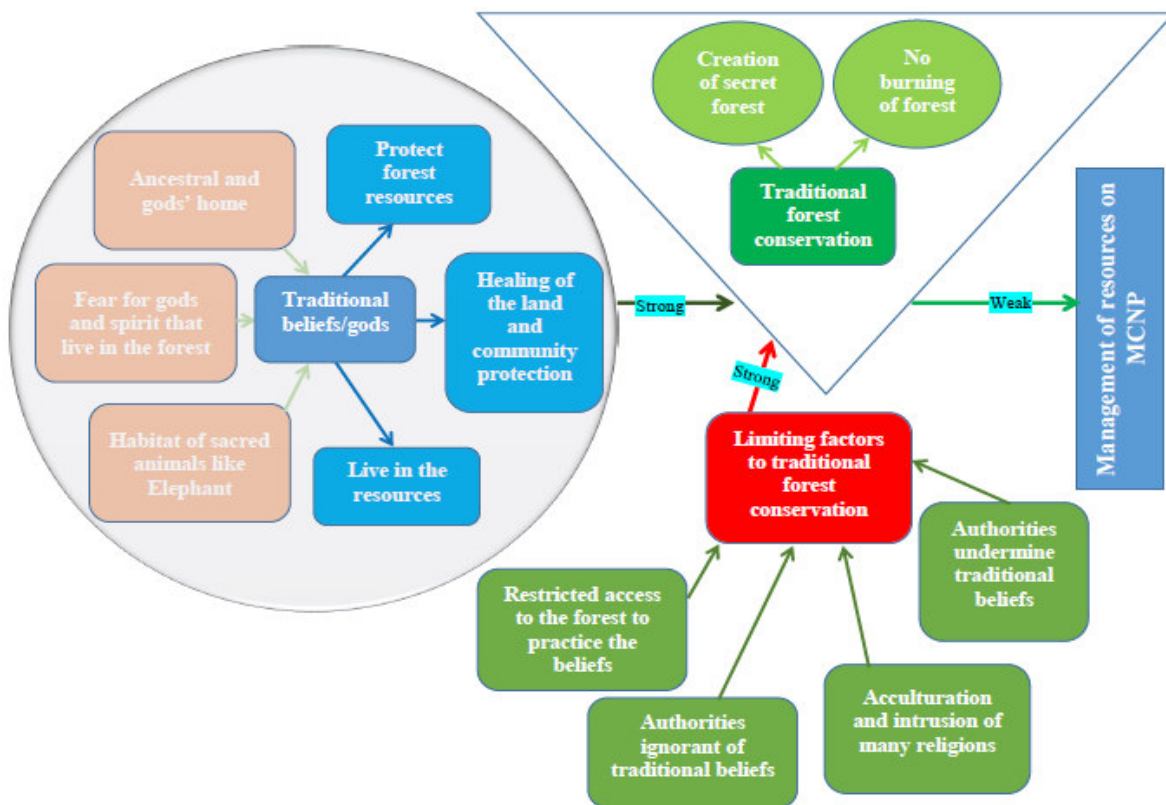
Figure 7: Conceptual diagram of traditional forest conservation

1.5   *Conclusion and recommendations:*

The findings of this research has revealed the role beliefs systems can play in management of natural resources. Significant evidence show that beliefs are related to the natural resources and FGDs elucidates people are tied up to the beliefs. Despite efforts made by management they stayed quiet about their grievances but continued 'pretentious' collaboration with management because the management will not respect their beliefs. Those who favored collaborative management also practiced traditional natural resources management which is an avenue that could be exploited to increase collaboration. These people know the significance of resources management but the resources are treated as an open resource and this has increased the rate of deforestation. To ensure true collaboration traditional resources management should be joined with collaborative management and state rules. If the bottom top approach is used it will ensure true collaboration since people usually respect their own rules than the rules of government. Their complaints that the government does not respect beliefs of the land puts the government at logger heads with them and cause them to be recalcitrant towards the regulation. The end result is chaos and conflicts over resources. Development index reveals that the people are poor and lack basic needs like water, food, health facilities and roads. The lack of these amenities hinders them to explore other avenues to generate income and makes them poorer in all aspects especially health and education which are vital in capacity development. The attempt to establish collaboration has not been fruitful because the people feel they are being deprived from their rights without any justification. They therefore pretend to collaborate yet exploit behind the back of the administration.

The findings of this research suggest the following; beliefs and culture should be respected and incorporated to the management plan, aboriginal people should be empowered, given alternative to generate income and integrated in the management (using a bottom-up approach in policy making), traditional resources management ought to be encouraged and combined with state rules which will serve as a gateway to collaborative management. Hunters as well as other indigenous groups should be given a place as they are a great resource in indigenous knowledge and they understand the terrain. They could be trained and made to train others; we recommend that they should be employed as Eco guards and trained as trainers because they are an asset to pass on indigenous knowledge and culture. Checking the basic needs of the people is a way forward to wining their hearts; there is a need to get them basic requirement of life; health units, accessible roads, drinking water and credit facilities among others. The culture of the people should be encouraged and we also recommend an in-depth study of the Bakweri culture and traditions to safe guard cultural erosion and help revive some practices which can enhance livelihood and natural resources management.

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