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Biodiversity Conservation and Commercial Bushmeat Hunting Challenges in African Parks and Protected Areas: A Critical Review and Synthesis of the Literature

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Abstract
Biodiversity conservation is seriously threatened in African parks and protected areas due to the explosion of commercial bushmeat hunting activities in buffer zone communities. Though commercial bushmeat hunting challenges are ostensibly underpinned by several factors (e.g. rural livelihoods challenges, wildlife management failure, unsustainable hunting practices, human population explosion, cultural factors, logging activities and road construction into hitherto intact forest reserves), the paper reveals that property rights struggles – hinging on colonial nationalization of the forest lands of local communities (now parks), constitutes the core of the problem. The existing literature attaches importance to livelihoods alternatives as mechanism of addressing the problem. The paper however argues that payment of compensation (sustainably) or annual land rents to buffer zone communities (as landlords), hinging on conservation agreements vis-a-vis colonially nationalized forest lands (now parks), will address the problem of commercial bushmeat hunting more effectively in the long term, and thus recommends this strategy strongly to policy makers. The paper also recommends biological species inventories and wildlife surveys as research trajectories that can inform and determine other appropriate conservation strategies in parks experiencing commercial bushmeat hunting challenges in Africa.
Keywords: Biodiversity, parks, conservation, bushmeat and hunting

1. Introduction

Biodiversity conservation and commercial bushmeat hunting activities in the buffer zone or surrounding communities of African parks and protected areas is attracting increasing conservation and multi-disciplinary research attention globally. Keystone fauna species are fast disappearing in several local communities due to unsustainable hunting practices. The ecological effects of commercial bushmeat hunting not only includes the depletion and extinction of fauna species, but the disruption of numerous ecological functions performed by such fauna species in forest ecosystems e.g. their roles in species evolution, food chains, inter-species competition and population control, seed dispersal and forest restoration, and several other roles that enhance ecosystems stability that humans do not know.

The paper critically reviews current literature on commercial bushmeat hunting activities, paying special attention to proposed solutions that are capable of addressing the problem. The first section of the paper delves into the importance of biodiversity conservation in parks and protected areas, global biodiversity hotspots, and IUCN categorization of protected areas. The second section examines the nature of the problem of commercial bushmeat hunting, while the third section delves into the issues and emergent themes underpinning commercial bushmeat hunting activities. Section four is a brief discussion on the issues and themes, followed by conclusion and policy recommendations. The paper reveals that while commercial bushmeat hunting challenges are underpinned by a number of factors, the core factor is property rights struggles hinging on colonially nationalized forestlands of local communities (that are now parks), for which no compensation has been paid. The paper concludes with a highlight of the research and conservation policy implications of the above.

2. The what, why and where aspects of biodiversity conservation

Biodiversity is the variety and variability among living organisms and the ecological complexes in which they occur (OTA, 1987). The World Bank (2010: 124) defines it as "the variety of all forms of life, including genes, populations, species, and ecosystems." Common and Stagl (2005:521) maintain that "biodiversity is the diversity of living organisms, the genes that they contain, and the ecosystems in which they exist."Similarly, Noss and Cooperrider (1994:5) maintain that "Biodiversity consists of more than just the variety of species; it involves the full range of species, variation within species, biotic communities, and ecosystems in a dynamic and ever changing process". Such biological species in any given ecosystem may include some or all of the followings: mammals, birds, reptiles, amphibians, fish, insects, fungi, bacteria, viruses and assorted plant communities

(BSP,1993).

The exact number of different biological species that exist on planet Earth is not known yet, but "their number is estimated at somewhere between 7 and 100 million" (Leveque and Mounolou, 2003:22). Common and Stagl (2005) uphold that taxonomists have so far identified and described a total of 1,750,000 different species, which represents less than 15 per cent of the widely accepted estimate on the global number of species. They maintain that the total number could be over 100 million, or as low as 3.7 million.The World Bank (2010: 124) similarly comments that "there are 5 million to 30 million distinct species on Earth; most are microorganisms and only about 1.75 million have been formally described."

2.1 Why is biodiversity important?

Biodiversity is of prime global importance, ecologically and economically (Perring et al.,1995). Ecologically, biodiversity provides life support system on planet Earth through processes such as global biogeochemical cycles (the cycling of water, carbon, oxygen, nitrogen, phosphorus and sulphur); energy flows between organisms (e.g. plant accumulation of solar energy via photosynthesis, animal utilisation of this energy, recycling of organic matter by decomposers); and trophic-structured food chains in any given ecosystem (Chapin III, et al., 2004:3 & Leveque and Mounolou, 2003:21). Economically, biodiversity is mankind's source of food and medicine, and raw materials for shelter, clothing, industry, and science and technology (BSP, 1993). The prosperity of individuals, businesses and the economic growth of world nations (since the industrial revolution), have continued to hinge on the exploitation of biological resources (Chapin III, et al., 2004).

Agricultural challenges in a climate changing world are expected to be addressed through biodiversity, especially reliance on "the genetic diversity of crops and their wild relatives" (Hawtin, 2008:4). Hawtin maintains that "it is the genetic diversity within crop gene pools that underpins the ability of plant breeders to produce new varieties through combining different traits in new combinations to meet new needs and circumstances" and that research and advances in biotechnology has made it easy to transfer genes from wild relatives into crops (Hawtin, 2008:4). In the same vein BSP (1996) uphold that all of the world's major food crops, including corn, wheat, and soybeans depend on new genetic material from the wild to remain productive and healthy. BSP (1996) further comment that breeders and farmers rely on the genetic diversity of crops and livestock to increase yields and to respond to changes in environmental conditions.

On biodiversity and human health Griffo (1995), comments that 79% of the top-selling prescription drugs in the United States are derived from biological resources. BSP (1996) inform that many synthetic drugs, including aspirin, were first discovered in wild plants and animals. WCMC (1992) comment that roughly 119 pure chemical substances extracted from some 90 species of higher plants are used in pharmaceuticals around the world. Traditional medicine, which depends on wild and cultivated plants, underpins primary health care for about 80% of all people living in developing countries (BSP, 1996). Common and Stagl (2005:526) also maintain that wild biological species are very "important as sources of inputs to the manufacture of drugs and medicines."

Biodiversity provides ecosystem services thatcover the entire planet Earth. Constanza et al (1997) summarize the typology ecosystems benefits, services, and functions to include gas regulation (regulation of atmospheric chemical composition), climate regulation (regulation of global temperature, precipitation and other climate processes), disturbance regulation (ecosystem responses to environmental fluctuations), water regulation (storage, selective filtering and retention of water), erosion control (retention of soils within an ecosystem), soil formation (soil formation processes), nutrient cycling (storage, recycling, processing and acquisition of nutrients), waste treatment (recovery of mobile nutrients and removal of excess nutrients and compounds), pollution control (movement of floral gametes), biological control (trophic-dynamic regulations of populations), refugia services (provision of habitats for resident or transient populations), food production (the portion of gross primary production extractable as food), raw materials (the portion of gross primary production extractable as raw materials, genetic resources (sources of biological material and natural substances), recreation (providing opportunities for recreational activities), and culture (providing opportunities for non-commercial use).

The imbalance created between the values of economics and ecology, in man's use and management of biological resources, has culminated in the global problem of biodiversity loss (Common and Stagl, 2005).Common and Stagl (2005) elaborate on the proximate causes of biodiversity loss to include: habitat loss (e.g. due to agriculture, forestry, and urban development), overharvesting of desired species, pollution problems, and human introduction of exotic species into natural environments around the world. BSP (1996) maintain that in recent decades, the loss of entire species and natural areas caused by human activities has been going on at unprecedented rates. In the same vein, the World Bank (2010:124) maintains that "in the last two centuries or so, humankind has become the driver of major extinction events on Earth."

The outbreak of global environmental problems like global warming and climate and the threat to life on planet Earth have culminated in a global paradigm shift towards biodiversity conservation (Chapin III, et al 2002; and Leveque and Mounolou, 2003). The 1992 United Nations Conference on Environment and Development (Earth Summit), at Rio De Janeiro, Brazil, led to the subsequent establishment of the United Nations Convention on

Biological Diversity (UNCBD), with headquarters at Montreal, Canada. This epitomises the global importance attached to biodiversity conservation. It is a core global strategy for sustainable development and the mitigation of the effects of global warming and climate change (Leveque and Mounolou (2003) and Common and Stagl (2005). Biodiversity related programmes are top on the agenda and mandate of Environmental Ministries amongst world nations, and in the development agenda of bilateral (e.g. DFID, USAID, GTZ, etc) and multi-lateral institutions (e.g. UNEP, World Bank, UNDP, UNIDO, GEF, UNCITES, FAO, etc). The UNCBD hinges global biodiversity conservation imperatives to the "intrinsic value of biological diversity and its ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values" (SCBD: 3).

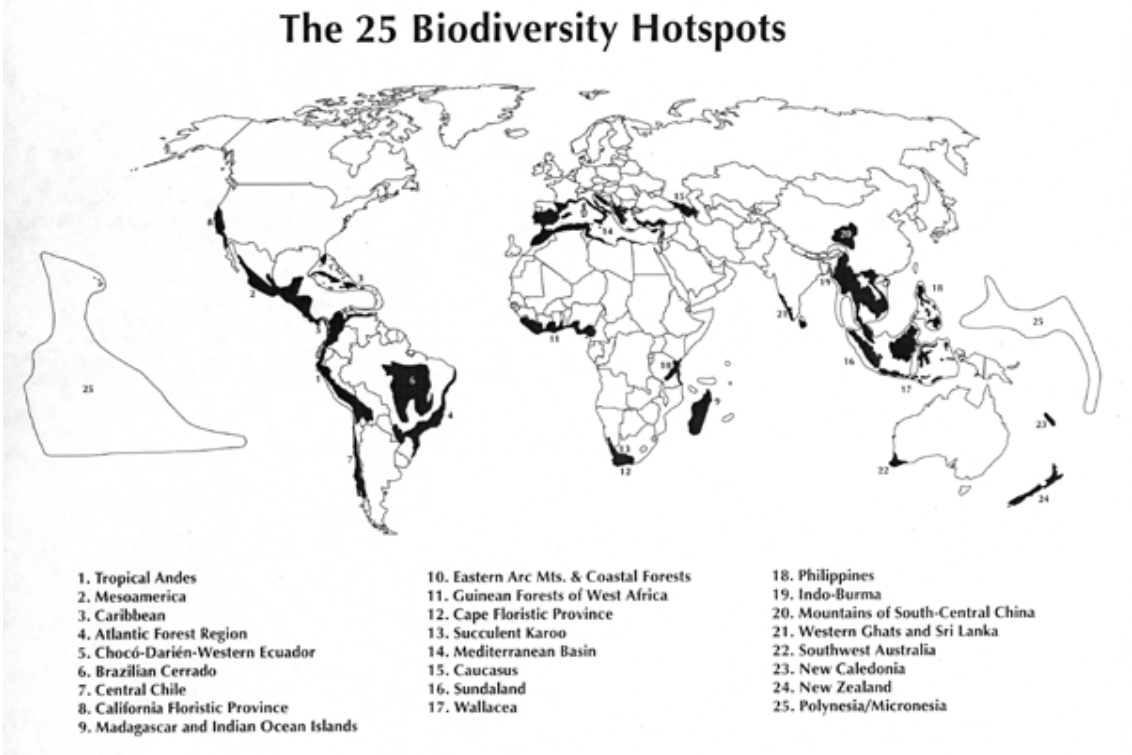
2.2 Global Distribution of Biodiversity

Biodiversity is not distributed evenly across the world (Leveque and Mounolou, 2003:27). See figure 1.1. Whereas some areas are rich in biodiversity, some others (indeed a larger percentage of the Earth) are not as rich. 75% of the Earth's biodiversity is found in the tropics (Tergboh, 2004). Similarly, the World Bank (2010:124) observes that

> "two thirds of global biodiversity is in the tropics. A 25 hectare plot in Ecuador was found to have more tree species than exist in all of the United States and Canada, along with more than half the number of mammal and bird species in those two countries."

On areas of global biodiversity richness, it has been studied and determined that there are twenty five biodiversity hotspots in the world (McNeely, et al., 1990). The global distribution of the hotspots is shown in Figure 1.1.

Figure 0: Global biodiversity hotspots



Source:Cincotta, et al. 2000.

There are also areas of species endemism such as those found in Madagascar and the great lakes of East Africa which comprises Lakes Tanganyika, Malawi and Victoria (Leveque and Mounolou, 2003).

In an attempt to account for the spatial differences in the global distribution of biodiversity, some ecologists have linked climate to vegetation, while others base their assessments on flora and fauna environmental relationships (Leveque and Mounolou, 2003).

2.3 Biodiversity conservation approaches and the national park system

One of the measures adopted globally to protect biological resources and thus ensure ecologically sustainable development, is the creation of parks and protected areas, traceable to America's Yellowstone National Park, established in 1872 (Mulongoy and Chape, 2004).Mulongoy and Chape maintain that in the decades following 1872, several nations around the world started protecting sites (e.g. Banff in Canada, El Chico in Mexico, Tongariro in New Zealand, and the Swiss National Park), and that "what had started as a trickle rapidly became a flood as new protected areas were created in virtually every country in the world" (Mulongoy and Chape, 2004:7). The above authors further maintain in table 1.1that IUCN categorises protected areas in the world into

six, based on different levels of human interaction and management regimes.

Table 0: IUCN categories of protected areas

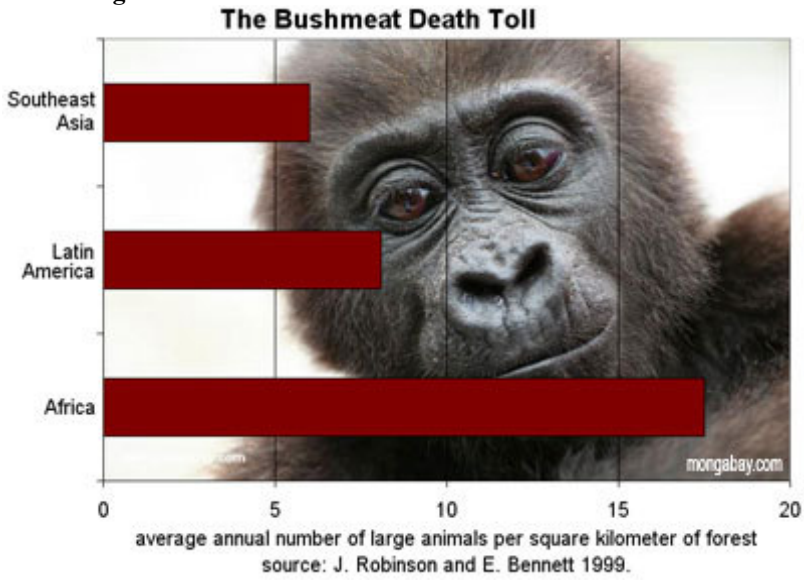
Categories	Description
Ia	Strict Nature Reserve managed mainly for science
Ib	Wilderness Area: managed mainly for wilderness protection
II	National Park: managed mainly for ecosystem protection and recreation
III	Natural Monument: managed mainly for conservation of specific natural features
IV	Habitat Species Management Area: managed mainly for conservation through management intervention
V	Protected Landscape / Seascape: managed mainly for landscape / seascape conservation and recreation
VI	Managed Resource Protected Area: managed mainly for the sustainable use of natural ecosystems

Source: IUCN, 2004.

3. Commercial bushmeat hunting challenges in Africa: nature of the problem

In tropical biodiversity conservation, the term 'bushmeat' is used to describe "wild animal protein that is hunted for human consumption" (Bowen-Jones et al., 2002:25). Brown (2003: 2) maintains that bushmeat is a 'colloquial African term' used to describe animals hunted for consumptive and other local livelihood needs. The term is gaining increasing popularity in West and Central Africa (Fa et al., 2002). Though there is bush meat hunting in other parts of the world, like Asia and Latin America, Africa remains the world leader in unsustainable commercial bush meat hunting activities (Robinson and Bennett, 1999). The human population in Africa is over 1 billion (UNDP, 2005), and with shortages in food production (especially animal protein), there is bound to be pressure on wild animal (bushmeat) resources in sub-saharan Africa (Tambi and Maina, 2003).Robinson and Bennet (1999) report on global bushmeat death toll, of which Africa tops the chart (Figure 2.1).

Figure 0: Africa leads the world in bushmeat death toll



In comparison with Asia and South America, Brown (2003) observes that offtake levels of bushmeat are highest in West-Central Africa because of higher productivity of forest ecosystemsin Africa. Robinson and Bennett (2000) argue that the ratio of sea coast to land area is higher in Asia, resulting in the abundance of sea fisheries, and human dependence on them (than bushmeat) for protein purposes. Fa and Peres (2001) explain that the forest of the Amazon basin have rivers with abundant fish, and mammalian biomass that are not only low, but predominantly arboreal. That is why human dependence on bushmeat is also low.

Commercial bushmeat hunting and trade constitutes a serious threat to biodiversity conservation in Africa (Bakarr et al., 2001; Oates et al., 2000; & Robinson and Bennett, 2000). The alarming rate of depletion of large mammal species (e.g. gorilla, chimpanzee and assorted drill monkey species), and international publicity on the subject by conservationists (Walsh, 2003 & Walker et al., 2002) and NGOs / animal welfare groups (Ape Alliance, 1998 & Petersen, 2003) have contributed immensely in making bushmeat hunting a major conservation issue in Africa. However, the bushmeat crisis in Africa should not be treated in isolation. It has links with not just national politics and macroeconomics, but with regional and international economics as a whole (Milner-

Gulland, 2002).
The trade in bushmeat cuts across the whole of tropical Africa, Asia and countries in central and South America (Bowen-Jones and Pendry, 1999). In Africa, the estimated volume of bushmeat hunted in the Congo Basin alone is between 1-5 million tonnes per annum (Wilkie and Carpenter, 1999). In Gabon, the overall annual bushmeat trade has been valued at about $25 million (Brown et al., 2008). Davies (2002) estimates the national value of bushmeat trade across selected countries in West and Central Africa, as ranging from US$42-205 million. Bahuchet & Loveva (1999) carried out an inventory of bushmeat traded in four major markets in Cameroon (between 1995 and 1996) and discovered that 70 – 90 tons of bushmeat was sold monthly. Wilkie et al., (1992) report that commercial bushmeat hunting activitries have become big business in Africa.
Brown et al. (2008:13) maintain that "rural people moving from a subsistence lifestyle to a cash economy have relatively few options for generating income." Sale of subsistence agricultural products and petty trade in local markets do not provide enough income to villagers, as does the sale of bush meat. The bushmeat trade has resulted in the establishement of permanent settlements along roads, replacement of traditional weapons with modern ones, abandonment of traditional life-styles, and rural participation in a cash economy (Lahm, 1996). Brown et al.,(2008:13) maintain that from first harvest to final sale, "the trade in bushmeat for local, national or regional trade now forms an important part of the informal sector's 'hidden economy'."
Brown (2003: 4) links the explosion of trade in bushmeat hunting to "low barriers to entry and high social inclusivity."He gives the example of Ghana where investment costs on hunting activitries comprises shot gun and ammunition, or snares. Anybody that is interested in hunting can do so anytime, and a key incentive here is that a major proportion of the revenue from bushmeat is retained by hunters. Compared with farming activities and timber and non-timber forest products (NTFPs), bushmeat hunting is a more lucrative venture. Hunters generate more revenue than government labourers, and in some instances generate as much revenue as young graduates joining the civil service (Brown, 2003).
The first bone of conservation contention here is that hunting practices are extremely unsustainable, exacerbating the depletion and extinction of large mammal species across several countries in sub-saharan Africa (Brown et al., 2008 and Maisels et al., 2001).The second bone of conservation contention is that much of the commercial bushmeat hunting activities are taking place in the territories of parks and protected areas (Infield, 1988). In Cameroon for instance commercial bushmeat hunting in Korup National Park is estimated at $US430,000.00 per annum (Infield, 1988). Commercial bushmeat hunting activities are also being carried out by villagers in Cross River National Park, Nigeria (ODNRI/WWF, 1989). If national parks are established through national legislation (in the case of CRNP: Decree 36 of 1991), why should local communities target such territories for commercial bushmeat hunting activities? The next section will examine emergent themes in the reviewed literature.

4. Analytical process

The critical literature review exercise commenced through a literature search and gathering of relevant textual information on African biodiversity conservation and commercial bushmeat hunting challenges in parks and protected areas (e.g. from journal articles, books, newspapers, magazines, websites of conservation organisations, conference proceedings, etc). From the research topic, an inclusion and exclusion criteria was drawn up and used in screening which articles or textual information were to be selected for the review exercise. Consistent with Ridley (2012), every selected paper was critically read culminating in written summaries, concept mapping and design of categories (themes from reviewed literature), used in extracting data from articles. As suggested by Babbie (2004), open coding was used to classify or arrange the concepts into categories or themes as presented in section 5.
Coding and data extraction from different articles, including strategies used by parks to address anthropogenic biodiversity conservation challenges, was followed by data synthesis (narrative synthesis of qualitative data). Consistent with Strauss and Corbin (1994: 278), a careful assessment and identification of "plausible relationships proposed among concepts and sets of concepts" by different authors was carried out, resulting in the articulation of connections between all the articles read and strategies used by parks and government to address commercial bushmeat hunting challenges. Babbie (2004: 370) maintains that "The more our research confirms a particular set of relationships among particular concepts, however, the more confident we become that our understanding corresponds to social reality."

5. Emergent themes and gaps in the reviewed literature

Environmental matters in general and biodiversity conservation issues in particular are multi-disciplinary in nature, often attracting the research attention, different standpoints, perspectives, and contributions of physical, natural and social scientists, environmental historians, journalists, politicians, and conservation organisations. Very interesting is how disciplinary biases and prejudices play out in the way different authors in both journals and books present their conservation facts and information. Even more interesting is the way two supervisors from two disciplinary backgrounds, supervising a doctoral conservation research student, will project their biases

in respect of preferred research trajectories. Disciplinary biases and prejudices in conservation research can be dangerous, as it could culminate in reading and reviewing certain preferred literature to the detriment of others, and arriving at findings and conclusions that may not be universally applicable. It is therefore important to be as open minded as possible in engaging with different literature on a biodiversity conservation topic like commercial bushmeat hunting in African parks and protected areas.

During the literature review exercise on *Buffer Zone Communities*, *Commercial Bushmeat Hunting and Biodiversity Conservation in Cross River National Park, Nigeria* – a doctoral research topic at the University of Reading, UK, several journal articles, books, newspapers, magazines, technical reports, and information manuals from different conservation organisations interested in bushmeat were assembled and critically perused. This paper is an offshoot of the above exercise. The issues underpinning commercial bushmeat hunting activities (as raised by different authors in the above publications) were eventually listed out and categorised into different themes. The dominant themes that emerged comprises rural livelihoods challenges and poverty, property rights struggles, unsustainable hunting techniques, public wildlife management context, cultural influences, population pressure, macro-economic issues, agricultural challenges, donor failure, and wars and saturation of local communities with guns. However, the severity of each of the above factors, differ from one country to another. Details on the major themes are presented as follows.

5.1 Rural livelihoods challenges and poverty

Forest communities rely on natural resources and biodiversity for food, medicines, wild meat, livestock fodder, income generation, socio-cultural values and soil and water management (CIFOR, 2005). The conversion of vast and biologically rich forest lands into parks and protected areas (hitherto serving the livelihood needs of people) has direct livelihood impacts on the buffer zone communities of such parks and protected areas (Kothari et al. 1998). Marrie (2004: 106) upholds that over 50% of existing protected areas have been established on the ancestral lands of indigenous people and local communities. As a result, enduring conflicts, instead of supportive roles often characterize relations among rural communities, policy makers, forest managers, and development agents. This is further exacerbated by "differing interests and interpretations of land-use policies and laws" (Barrow et al., 2002). Tropical forests and neighbouring villages in sub-saharan Africa are seriously threatened ecologically and economically (Plumptre et al. 2003; PRIME 2005).

Based on local people's dependence on forest resources for their livelihood needs, IUCN (1991) advanced the concept of sustainable utilization of biological resources by buffer zone communities of parks, stressing that such practices are consistent with the philosophy of conservation and sustainable development. However some conservationists and reviewers argue that sustainable use depletes biological diversity (Redford and Richter, 1999). Brandon et al., (1998: 2) comment that the trend to promote sustainable use of biological resources as a means to the protection of such resources, sounds "politically expedient and intellectually appealing, but not well grounded in biological and ecological knowledge." They maintain that not all things can be preserved through sustainable use; not all places should be open to use; and that conservation strategies promoting sustainable use will culminate in biodiversity loss.

The commercialization and utilization of bush meat in many developing nations remains a frontline issue at the intersection between biodiversity conservation, livelihoods and food security (Mainka et al., 2002). Elaborate research has highlighted the ever increasing utilization of bush meat in different parts of Africa (Friedman, 2003; Chardonnet et al., 2002; Barnett, 2000; and Bakarr et al., 2001). Bush meat plays a leading role in local food security, engages more people than any other wildlife activity, and significantly contributes towards rural revenue generation (Brown et al., 2007). Sherr (2000: 490) stresses that access by the landless and rural poor to basic "subsistence resources – farmed and gathered food, fodder, water, fuel, building materials, medicines, raw materials for tools and housewares – is essential for livelihood security." Wunder (2001) maintains that rural households depend on diverse wild foods and protein sources to provide food security and supplement diets.

Wild animal products constitute important items for consumption or display and have rich medicinal and spiritual values in several human cultures (Scoones et al, 1992). Across nations in the tropical world, several people benefit from wild meat: from those who consume it as part of a forest-dependent way of life, to "those who trade and transport it at all points along different supply chains, to those who consume it in restaurants and homes, often far from the forest" (Brown et al, 2008: 13).

Survival has continued to be a major reason why villagers in the buffer zone of parksand protected areas trespass into such territories for bush meat hunting purposes. A feasibility study document on Cross River National Park, prepared by ODNRI/WWF (1989:12) aptly observes that "beyond farming, hunting and gathering, few opportunities exist for regular employment."Hilson and Ackah-Baidoo (2011: 1192) maintain that in sub-Saharan Africa, "41% of the human population susbsists on a daily wage of less than US$1, a higher proportion than any other area of the world." A number of international organizations working on bush meat issues such as the Overseas DeveIopment Institute [1], UK Tropical Forest Forum[2], and (Bush meat crisis taskforce(BMCTF[3]) all agree that livelihood challenges are

at the core of reasons accounting for villagers' frequent trespass into the territories of parks and protected areas in the tropics.

Bowen-Jones and Pendry (1999: 233) observe that over the years subsistence hunting has been widespread in Africa, but that given the scale of the bushmeat crisis in the continent "it is difficult to distinguish subsistence hunting from commercial hunting." They stress that most hunting activities in African rural communities are driven by cash or income necessities and not protein needs. For villages around Korup National Park in Cameroon, Infield (1988) maintains that 33% of total village income is derived from bushmeat. A number of researchers strongly maintain that commercial bushmeat hunting activities in Africa has reached unsustainable levels (Wilkie and Finn, 1990; & Fa et al. 1995).

5.2 **Property rights struggles**

Hallowell (1943) defines property right as a triadic social relation that involves benefit streams, right holders, and duty bearers. Innovating on the above definition, Bromley (1990:2) maintains that property right "is a claim to a benefit stream that some higher body – usually the state – will agree to protect through the assignment of duty to others who may covet, or somehow interfere with the benefit stream." To enhance proper understanding of ownership, Fedderke et al. (2001:115)explain that "ownership comprises the right to possess, the right to use, the right to manage, the right to capital, the right to security, the incident of transmissibility and liability to execution." They argue that it is only when all of the seven incidents included in the above definition are present that the term property rights "would be equivalent to a perfect score of 100."

Bruce (1993:3) defines property rights as "a set of rights and responsibilities concerning a thing." It signifies a relationship between resource use claimants and those it behoves to observe the associated terms and conditions of the claims (Bromley, 1989:871). Brazel (1997) maintains that property rights are social institutions, including formal legal codes and informal social norms, which define and enforce the range of privileges granted to an individual or a group of individuals with respect to specific economic resources. Khan (2004:32) stresses that "secure property rights or usufruct rights are vital for the sustainable livelihoods of forest dwellers, and the conservation of forests for the future."

In the developing world, "not much is known about the pre-colonial pattern of land ownership, except that it was predominantly communal" (Khan, 2004:207). However, several authors maintain that forest resources were kept as common property by local people that live close to them (Singh, 1986; Guha, 1993 & 1989). This implies that before the advent of colonialism, the notion of private property or private ownership of forest resources was new to local villagers. Khan (2004) argues that though the above may not imply open access, customary rights existed over forest resources in local communities. Similarly, Singh (1986) maintains that though local people were not owners of forest resources, they had usufruct rights. He further maintains that the right of ownership was vested on the local traditional rulers, who did not infringe on the exercise of usufruct rights by fellow villagers. Guha (1993) stresses that before colonialism, forest resources were used by locals for subsistence purposes, with no option of commercial exploitation.

The advent of colonialism brought state control and nationalisation of forest resources, by way of the creation of Government Forest Reserves (GFRs) and Community Forests (CFs) in the 1930s (IUCN, 1986 & Sivaramakrishnan, 1995). Banuri and Marglin (1993) inform that the above policies contained elaborate punitive measures for villagers who trespassed into government forest reserves for livelihood activities, including hunting. Guha (1993), maintains that local communities began different forms of resistance to colonial forest policies, as it undermined their customary rights over forest resources. In the words of Schickhoff (1995:11), "Their traditional usufruct rights that had been practiced from time immemorial, were now limited."

Several reviewers link parks – people conflicts (including bushmeat hunting activities) to property rights struggles (Naughton-Treves and Sanderson, 1995; Naughton-Treves, 1999; Johnson and Forsyth, 2002; Mapedza, 2007; and Timko and Satterfiefd, 2008). Scott (1955) maintains that uncertainty in property rights over natural resources leads easily to over-exploitation and resource degradation. This implies that property rights determination over wildlife is vital to their sustainability on any landscape. The key wildlife property question that follows is 'who owns wildlife, and who governs wildlife and its habitat?' (Naughton-Treves and Sanderson, 1995:1267). They argue that compared to land (which is immobile and can easily be demarcated and surveyed), wildlife is a fugitive resource that becomes owned only when it has been killed by a hunter. If not killed, wildlife is said to be ownerless, and thus can migrate from one ecosystem type to another or even from country to country (especially countries sharing a common vegetation region e.g. rainforest).

Naughton-Treves and Sanderson (1995: 1270) also argue that the delineation of wildlife as property is all the more difficult because "the range and distribution of wildlife species often exceed political jurisdiction" and that

[1]http://www.odi.org.uk/projects/03-05-bushmeat/ as at 15/03/09

[2]http://www.forestforum.org.uk/tradee.html as at 12/03/09

[3]http://www.bushmeat.org/portal/server.pt as at 15/03/09

ecological geography rarely corresponds with political geography. For instance several migratory bird species (e.g. vireos, warblers, and fly-catchers) spend over half the year in the tropical wintering grounds, while their breeding grounds are in the northern hemisphere (Terborgh, 1989). Such birds belong neither politically nor ecologically to any particular country, human ethnic group, or village. In such circumstances (which is typical of other wildlife resources), who can lay property rights claims over them? On the strength of the above, Naughton-Treves and Sanderson (1995: 1273) conclude that "no existing propery form (private, public, or common property) is adequate for conservation of biological diversity." They strongly stress that wildlife species require freedom to move across landscapes devoid of human imposed property rights boundaries.

5.3 Unsustainable hunting techniques

Hunters in sub-Saharan Africa adopt different methods of commercial bushmeat hunting activities which are generally unsustainable. Kumpel (2006) lists the different methods which comprises snares (foot, neck, fence, tree, pitfall), iron-jaw or gin traps, pit traps, net drives, guns, crossbows, bow and arrows, blowpipes, spears, catapults, dogs, machetes, poisoning, fire, dazzling by torchlight and gathering by hand (for species like tortoises). Hunters freely adopt any or all of the above hunting methods as they like, with little or no legal restrictions from public wildlife management authorities. That has contributed seriously in exacerbating the depletion and extinction of several fauna species in African parks and protected areas.

Robinson & Redford (1991) maintain that sustainable harvest requires both the maintenance of the resource so that it can be exploited for human welfare, and the conservation of the species being exploited and the biological community in which it lives. Trapping / snaring are not conservation friendly as they are non-selective (male or female, big or small, young or old) of fauna species. Snaring in most cases culminates "in large amounts of wastage, due to animals being scavenged or decomposing between checks of the snare, as well as animals escaping, often with fatal or debilitating injuries" (Kumpel, 2006: 23). Though hunting with guns allows a much greater degree of prey choice or selection, hunters in sub-Saharan Africa engage more in trapping activities due to financial costs associated with gun hunting (e.g. purchase of gun, cartridges, maintenance and license fees).

5.4 Public wildlife management context

Though many problems of management deal with human and material resources, and thus deserve mention in an expanded definition of wildlife management, Sinclair et al. (2006:2) underscore the core or literal meaning of the concept by defining wildlife management as "the management of wildlife populations in the context of the ecosystem." They further maintain that the four goals of wildlife management are to:

(i) make it increase, (ii) make it decrease, (iii) harvest it for a continuing yield, and (iv) leave it alone but keep an eye on it. Robinson and Bolen (1989: 2) define wildlife management as

> "the application ecological knowledge to populations of vertebrate animals and their plant and animal associates in a manner that strikes a balance between the needs of those populations and the needs of people."

Robinson and Bolen (1989) also maintain that the wildlife management approaches where ecological knowledge is applied are three: preservation (which prohibits human intervention); direct manipulation (which involve trapping, shooting, poisoning, and stocking of animal populations; and indirect manipulation (which involve the alteration of wildlife habitat).

Shaw (1985) traces the origin of wildlife management to English common law where the signing of the Magna Charta in A.D. 1215 transferred the ownership of wildlife from the chown to the people. He maintains that the custom of publc ownership of wildlife eventually crossed the Atlantic to North America, from where it spread to different parts of the world. Gilbert and Dodds (1992) draw examples of modern public wildlife management from the USA and Canada, which entails legislation (e.g. federal and state wildlife Acts), policies and programmes, and the establishment of wildlife management departments (e.g. the US Fish and Wildlife Service).

On African wildlife management, Jambiya et al. (2007:32), writing about Tanzania, observe that "since the wild meat trade is illegal, law enforcement and other measures to enhance protected area management capacity have been the main strategies of the government to date." However, Brown(2003:14) argues that "the present situation – of presumed illegality at all levels – is neither conducive to the development of participatory management models or to broader governance reform." Egbe (2000:10) similarly maintains that "a law which makes the most common form of conduct illegal is itself an instrument of indiscipline and serves neither the interests of the State nor . the communities."

On the rationale for conservation and wildlife management outside national parks and reserves, Caughley and Sinclair (1994:275) comment that "some species or associations of species occur only rarely in reserves because parks and reserves do not capture a representative sample of the biota." They maintain that the main mechanism by which wildlife management can be promoted outside parks and protected areas, is through legislation. On wildlife managemtn outside parks and protected areas, it has been observed that amongst West and Central African nations, hunting rules and regulations do not exist on their own, but are often part of forestry laws (Brown, et al. 2008), and thus result in wildlife management having to compete for attention with other lucrative forestry activities like logging concession administration (Dunn and Otu, 1996). Thus,forestry officials find the

management of logging concessions more lucrative, and thus tend to see bushmeat hunting as an insignificant or minor activity of the rural poor, that deserves to be ignored. In countries like Congo and Gabon, hunting is not illegal (Brown et al., 2008), as the law provides for licensed hunting or hunting permits – 'permis speciaux' (Congolese legislation) and 'permis de chasse' (Gabonese forestry code).

In the rest of the countries in West and Central Africa, Brown et al.,(2008:27) maintain that "hunting rules and regulations exist almost everywhere, but they are rarely enforced. There is clearly an ownership and management problem. The State is the owner of the resource and issues rules and regulations to manage it, but the State is unable to enforce its decisions."

Federal and State laws in Nigeria protect certain animals and allow hunting for several other species (ODNRI/WWF,1989a: 33). The plan (feasibility study) document on Cross River National Park, (ODNRI/WWF 1989a:33), conveyed certain privileges to buffer zone villagers which include "the right to bear licensed firearms and to shoot by day, certain species of animal for sale or for personal consumption." The above, coupled with lack of wildlife management capacity has helped to exacerbate bush meat hunting in and around Cross River National Park.

5.5 Cultural influences

All over the world, nature and human cultures are inextricably intertwined (Corvalan et al., 2005). Pretty et al. (2008) maintain that a strong relationship exists between human societies and nature, for which distinctions between social systems on the one hand, and natural systems on the other hand are arbitrary and unjustified. However, there are cultural differences in how human societies (e.g. ethnic, tribal, and racial groups)interact with nature - across villages, towns, and cities indifferent world nations.Human societies (ethnic, tribal, or racial groups) practice different cultures and the culture of any group of people is that

"set of beliefs, customs, practices and ways of thinking that they have come to share with each other, through being and working together.At the visible level, the culture of a group takes the form of ritual behaviour, symbols, myths, stories, sounds and artefacts" (Stacey, 1999:31).

Shurmer-Smith (2002:3) maintains that "culture is practised, not owned. It is what people do, not what they have, and they keep doing different things in different ways, with different other people all of the time." Traditional societies have lived and interacted with the environment for centuries (Balee, 1994), and nature and culture converge at several levels that include values, beliefs, norms, livelihoods practices, and local knowledge (Pretty et al., 2008).On the strength of the above, a mutually reinforcing relationship exists between cultural systems and environmental systems, in such a way that a shift in one usually leads to a change in the other (Maffi and Woodley, 2007). In biological resources conservation, the recognition of cultural traditions and myths prevalent in local communities enhances better understanding of people's environmental interactions (Gonzalez and Martin, 2007). For conservation interventions to work in various contexts, it is thus instructive "to pay attention to the ways in which human beliefs, values and ideals continuously shape landscapes" (Cosgrove, 1988:39).

Across cultures, there are cultural and spiritual values attached to biodiversity (Schama, 1995). The cultural importance of biodiversityconsists not just tangible goods and services, but intangible or non-material services and values as well. The cultural and spiritual values constitute an integral part of indigenous and local people's cosmovision and play a major role in shaping their environmental perceptions (Schama, 1995). For instance humans in different cultures have different non-material ties to landcapes (e.g. mountains, hills, valleys, and caves), vegetations (e.g. grasslands, forests, and wetlands), water bodies (e.g. ponds, streams, lakes, rivers, and ocean), and fauna diversity (e.g. insects, fish, amphibians, reptiles, birds, and mammals) (BSP, 1993). Sauer (1965) maintains that human cultures shape biodiversity through direct selection of different flora and fauna species (in contemporary usage), and different landscape modification initiatives.

In biodiversity conservation the importance of cultural and spiritual values has been recognised by different sectors and institutions, from local, through national to global levels. Prominent examplescomprise UNESCO Universal Declaration on Cultural Diversity (2001), UNESCO Convention on Intangible Values (2003), Ramsar resolution VIII. 19 on cultural values of wetlands (2002)and the acknowledgement of cultural services of ecosystems in the UN Millenium Ecosystems Assessment report (2005). Prominent position has been accorded indigenous peoples at the UN through the Permanent Forum on Indigenous Peoples. It is equally instructive to note that IUCN mentions cultural resources in her definition of protected areas

> Area of land and / or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means (IUCN, 2003)

In some parks and protected areas, indigenous and local peoples are culturally known to have been undertaking environmental practices that are supportive of biodiversity conservation, and maintaining biodiversity in such context depends on the continuity of such practices (Barber et al., 2004). Pretty et al. (2008) comment that indigenous and traditional cultures have developed livelihoods practices that alter landscapes, but do so with care so as to ensure the sustainability of the natural resource stock. Callicott and Nelson (1998) similary comment

that native and indigenous groups have different ways of incorporating nature into their culture, in frameworks that are environmentally ethical. For instance the indigenous people found in Sierra Nevada de Santa Marta in Colombia, are mountain people accustomed to naturally sustainable environmental interactions (meeting both livelihoods needs and environmental sustainability needs) (Gonzalez and Martin, 2007). Rather than evictions, it is important for conservation to encourage such sustainable or harmonious interactions between nature and culture.

Sutherland (2003) observes that many of the world's core areas of biodiversity concentratins or biodiversity hotspots are also core areas of cultural diversity, represented through dense ethnic and linguistic diversities. This should not be seen as coincidence, as indigenous and local people's diversity of institutions, livelihood practices, values, land tenure and resource management systems are likely to have contributed to biodiversity levels (Pretty et al., 2008). They further maintain that conservation scientists and policy makers who ignore the role that cultures have played and will continue to play in biodiversity conservation, more or less, ignore "the greatest variable in the biodiversity equation" (Pretty et al., 2008:7).

In some cultures, the stories and environmental lessons transmitted from one generation to another help to restrict or regulate natural resource use, and while such management strategies have symbolic or mythical origins, they have positive ecological impacts in ecosystems management (Gonzalez and Martin, 2007).They maintain that people's perception of nature is dependent on culturally defined values and belief systems which constitute important intergenerational source of information, and guide on human environmental practices. Accordingly, many societies attach great importance to historically or culturally important landscapes or culturally important species (Posey, 1999).

Bottom-up conservation strategies that recognise positive local cultural values have greater chances of success than top-down strategies that ignore or despise such values (Posey, 1999). Local cultural values here cut across rules and regulations, taboos, and local ecological knowledge in the use and management of biological resources. Gonzalez and Martin (2007) maintain that indigenous or local communities may be uninterested in the concept of protected areas if it limits certain traditional practices. Conservation management or resource development projects that ignore cultural values, more or less trigger conflicts, and upset cooperation amongst stakeholders (McNeely, 2005).

A key question here is on how cultural factors are shaping commercial bushmeat hunting activities in parks and protected areas. In their study of local perceptions of the importance and reasons for hunting, gender differences and opinions about mitigating measures among villagers around Serengeti National Park, Tanzania, Kaltenborn et al. (2005:213) observe that "hunting is driven by the need to not only increase food supply and cash income, but to also fulfil cultural and social needs." Reporting also on Serengeti National Park, Mfunda and Reskaft (2010) maintain that bushmeat is in high demand because it provides trophies for cultural artefacts and medicinal values.

Brown et al. (2008:16) maintain that "while hunting provides meat and income, it also remains an important social and cultural tradition for many peoples, both in developed and in developing countries." They further comment that throughout the tropical forest regions of the world, animal parts are popularly used as cultural artefacts, personal adornment and trophies. In some cultures, a man's societal importance, respect and capacity to win a bride is linked to his hunting skills and achievements (Posewtz, 1994; Bennet and Robinson, 2000). The curiosity here is how commercial bush meat hunting in Cross River National Park relates to the cultural dynamics of buffer zone villages.

Another issue of interest is on how communities culturally perceive bushmeat hunting activities. Do they share with global IUCN concerns on the depletion and extinction of various flora and fauna species? It has been strongly argued that "it is impossible to change organisations which do not accept the dangers of their present way of doing things" (Harvey-Jones, 1993:67). The same thing is applicable to individuals, groups of people or local communities. Accordingly, the conservation problem of commercial bush meat hunting in Africa may never be resolved effectively without probing its cultural context. Accordingly, this research will pay special attention to the cultural context of the problem.

5.6 Human population pressure

Accelerated human population growth in the tropics has been generally linked to the rising demand and consumption of bushmeat in Africa (Fa and Yuste, 2001). Nasi et al (2011) observe that a growing population of urban dwellers in tropical nations prefer bushmeat to other sources of protein (e.g. livestock, poultry and fish). Thus, rising urban demand is the primary driver of commercial bushmeat hunting activities in parks and protected areas in Africa (Bennett et al, 2007; and Davies, 2002). Bushmeat is freely sold in urban markets in several African nations, and in some instances they are supplied directly to consumers due to established trade (demand / supply) relations over time.

In the Congo Basin urban bushmeat consumption is significant and constitutes a major conservation problem (Chardonnet et al., 1995). They report that urban populations in Gabon, DRC and CAR consumed on average 4.7 kg/person/year of bushmeat. Although urban bushmeat consumption per capita appears significantly lower than

in rural areas according to most available studies, the contribution of urban areas to the overall bushmeat consumption is high and likely to become higher as the population of Central African coun- tries becomes more urbanised. Given the very significant urban and rural consumption and the either inexistent (e.g. Gabon, DRC, Congo) or pretty limited (Cameroon, CAR) domestic livestock sector, bushmeat remains a crucial component of food security for the Congo Basin (Nasi et al., 2011).

5.7 Proposed measures of mitigation

Several measures have been proposed on how to address commercial bushmeat hunting challenges in parks and protected areas. Integrated conservation and development projects (ICDPs), which includes livelihood activities, were popularly introduced in the 1980s (Brandon & Wells, 1992; Barret & Arcese, 1995; and Brown & Wyckoff-Baird, 1995). Following allegations of ICDP failure in different parks to promote effective biodiversity conservation (Terborgh, 1999 & Rabinowitz, 1999), a number of reviewers have called for a return to authoritarian park protection, hinging on arrest and punishment of hunters and others that trespass into park territories for economic activities (Oates, 1999 & Rabinowitz, 1999).

The provision of alternative protein sources to local communities either through captive-bred bushmeat species, or 49nvestments in livestock rearing is seen to be capable of reducing commercial bushmeat hunting pressure (Heymans, 1994; and Wilkie & Carpenter, 1999). Since urban consumers are the ones responsible for the ever increasing demand for bushmeat, Milner-Gulland (2001) proposes regular inspection of urban markets and imposition of fines or arrests of bushmeat sellers. He further proposes the imposition of restrictions on the weapons used by hunters in undertaing commercial bushmeat hunting activities.

Sustainable hunting strategies have been recommended by some authors. Wilkie and Carpenter (1999) suggest the zonation of forests and approval of permit hunting in certain areas, in conformity with effective monitoring of wildlife populations. Wilkie and Godoy (2001) propose increase in prey species abundance through stocking certain parts of the forest or through manipulating the ecosystems to enhance productivity or reduction of mortality. Similarly, Bowen-Jones and Pendry (1999) recommend a number of measures which include conservation education of hunters, taxes on bushmeat transportation, strengthening of traditional user rights (in frameworks that exclude outsiders and ensuring sustainable use), designation of hunting seasons / closed hunting seasons, designation of protected areas where all types of hunting activities are prohibited, and setting of quotas for bushmeat harvest in relation to population densities and prey species rates of productivity. Table 2.1summarises the proposed measures of mitigation indicating those targeted.

Table 0: Proposed measures on hunting mitigation

Author(s)	Measure	Target
Brandon & Wells, 1992; Barret & Arcese, 1995	Integrated conservation and development projects (ICDPs) which includes rural livelihoods activities.	Hunters and other buffer zone villagers.
Oates, 1999; Terborgh, 1999 & Rabinowitz, 1999.	Return to authoritarian park protection hinging on arrest and punishment of hunters and other park offenders.	Hunters and other buffer zone villagers.
Heymans, 1994; and Wilkie & Carpenter, 1999.	Provide cheap alternative protein sources such as domesticated or captive-bred bushmeat species e.g. Cane Rats (*Thryonomys swinderianus*), or carry out livestock-rearing.	Hunters and consumers
Bowen-Jones and Pendry, 1999.	Promote conservation education programmes designed to reinforce or strengthen traditional taboos on the consumption of certain bushmeat species. (b) Tax bushmeat transportation (c) Strengthen traditional resource user rights in frameworks that exclude outsiders and ensures sustainable use. (d) Designate closed hunting seasons. (e) Designate protected areas where every form of hunting is banned. (f) Set quotas for bushmeat harvest vis-a-vis population densities and prey species rates of productivity.	Hunters and consumers Transporters Hunters Hunters Hunters Hunters
Milner-Gulland, 2001.	Inspect urban markets and impose fines or effect arrests of bushmeat sellers.	Traders
Wilkie and Carpenter, 1999.	Zone the forest and permit hunting in certain areas in accordance with effective monitoring of wildlife populations and hunting pressure.	Hunters
Wilkie and Godoy, 2001.	Increase prey species abundance through stocking certain forest areas or through ecosystems manipulation to enhance productivity and / or reduce mortality.	Hunters
Milner-Gulland, 2001.	Impose restrictions on the weapons used by hunters e.g. cable snares and shot guns.	Hunters

5.8 Discussion

How conservation territories are acquired for biodiversity conservation purposes is very important and remains

the first source of tension in parks – people's relations in African parks and protected areas. The territories hosting parks and protected areas in Africa were colonially nationalised by some European powers in the 19th and 20th century. Just as colonialism was stoutly resisted by African freedom fighters, culminating in the dismantling of colonialism in the second half of the 20th century, so have local communities been resisting the legitimacy of government ownership of the forestlands of parks and protected areas in post-colonial Africa. A major reason why local villagers continue to perpetrate hunting trespass into the territories of parks and protected areas in Africa is their enduring conviction that the forest lands of parks and rich biodiversity belong to them. They have been protesting parks' land dispossession policies and the colonial nationalization of their forestlands in different ways since the 1950s (Mapedza, 2007). Timko and Satterfield (2008:252) note that "even in the heavily fortified national parks such as the Kruger, the illegal harvesting of wildlife occurs on a regular basis." McShane (2003: 52) comments that rural poverty "has its roots in the loss of rights to resources that rural communities have traditionally considered their own. It is these rights to timber, water, land and wildlife that are essential elements to sustainable development. The starting point in the protected area-poverty debate is to recognise that the cost of protected areas is often at the expense of the poor (e.g.through expropriation of their land or by having them deliver global public goods for free."

Adams and Hutton (2007) maintain that where the establishment of parks entails human displacement, such communities should be compensated. Similar calls for compensation of local communities that have been dispossessed of their forest territories for conservation purposes include Balmford and Whitten (2003), Ferraro and Simpson (2001), and James et al., (2001). Ferraro and Kiss (2002) argue that direct financial payments to local communities, based on properly negotiated conservation agreements, will be a better biodiversity conservation strategy, especially when compared to ICDP initiatives that are not based on legally binding agreements. On evictions and in some cases resettlement of displaced local communities (following the creation parks), Schmidt-Soltau and Brockington (2007:2182) aptly observe that "best practices for resettlement should require prior, free and informed consent of the affected people."Elaborating on a possible formula for the compensaton of local people, James et al., (2001: 47) maintain that in the tropics

> "the total land value of all reserves (parks and protected areas) is estimated to be $49.5 billion. Assuming a discount rate of 10%, annual compensation for these existing reserves should be approximately $4.9 billion. The compensation payment averages $1,365 per square kilometre per year – a significant amount, considering that most parks in developing countries are run on only a few hundred dollars per square kilometre per year. For example, the communities surrounding Mikumi National Park in Tanzania, a reserve of 3,230 square kilometres, would collectively receive $2.6 million a year in compensation"

In South Africa, the creation of Ndumo Game Reserve in 1924 culminated in the eviction of Mbangweni community, the original owners who lost all rights to their ancestral land (Naguran 2002). With the end of apartheid and enthronement of democracy in 1994, the government of South Africa redressed the problem by negotiating and reaching a legally binding agreement which "transformed the eastern part of the Ndumo Game Reserve from what was essentially a state property regime to a common property regime" (Naguran 2002:8), among other benefits. Magome and Murombezi (2003) similarly report that following the end of apartheid government in South Africa on 27th April 1994, and litigation over Richtersveld National Park lands, judgement was reached in favour of Nama people (the original land owners). They maintain that the outcome of the negotiations gave significant concessions to the Nama people which includes (i) a contractual land agreement that recognised Nama people as land owners, (ii) a lease fee of £20,000.00, (iii) grazing rights for 6,600 livestock (mainly goats and sheep), (iv) reduction of the size of the park from 2,500 to 1,625 km^2, to allow 800 km^2 of additional grazing land, (v) creation of a park management committee that had more Nama representatives than other government appointees, (vi) guaranteed job opportunities for Nama people, and (vii) a duration of 30 years, after which the lease agreement has to be reviewed. The above, eliminated the contestations that used to exist at the Richtersveld National Park.

Ostrom and Schlager (1996:137) maintain that "the significance of a well-established property-rights system is the security that enforced rights give to individuals and groups of individuals that their access, withdrawal, management, exclusion, and /or alienation will be recognized in the future by potential competitors."

The comments of the above authors strongly suggest the need for parks in Africa to address the property rights questions that presently shape the anti-conservation practices of buffer zone communities, such as commercial bush meat hunting. Naughton-Treves and Sanderson (1995: 1265) argue that a major part of the conflict over wildlife conservation "involves property, and property rights", and thus conclude that "the political determination of property regimes is critical to conservation."

Rather than address the forest ownership / compensation demands of buffer zone communities (over nationalised territories hosting parks), several African parks have been investing in integrated conservation and development activities (which includes rural livelihoods), in the hope that such interventions will attract positive conservation outcomes from benefitting buffer zone communities. That has not really worked. A key issue in African

biodiversity conservation challenges is that Property rights contentions over nationalized park territories and call for sustainable compensation (payment of annual land rents) to communities, is continuously ignored by conservation authorities and governments. Parks cannot continue to serve global sustainable development objectives whose costs are borne by the world's poorest and marginalised people only.

One suggestion could be to introduce a global sustainable development tax on businesses, and such funds used to annually finance a sustainable compensation scheme for buffer zone communities of parks across the world. The sustainable compensation scheme should be tied to biodiversity conservation objectives, strict community compliance and strict park protection. Current strict park protection efforts are insensitive to property rights contestations, and are therefore not yielding positive conservation results. Communities are now overtly and covertly engaging in hunting activities due to property rights arguments, and other ignored social impacts that attended the creation of most African parks. It may be instructive to note the World Bank's (2010:126) call for greater flexibility and sensitivity to the concerns and perspectives of communities already adversely affected by conservation initiatives

6 Conclusion and recommendations

African biodiversity conservation strategies in parks and protected areas, is seriously threatened by the explosion of commercial bushmeat hunting challenges in buffer zone communities. The problem is attracting increasing conservation and multi-disciplinary research attention globally. Keystone fauna species are fast disappearing in several local communities due to unsustainable hunting practices. The ecological effects of commercial bushmeat hunting not only includes the depletion and extinction of fauna species, but the disruption of numerous ecological functions performed by such fauna species in forest ecosystems e.g. their roles in species evolution, food chains, inter-species competition and population control, seed dispersal and forest restoration, and several other roles that enhance ecosystems stability that humans do not know.

The paper critically reviews and synthesizes the bourgeoning literature on commercial bushmeat hunting challenges in African parks and protected areas, paying special attention to conservation programmes designed by parks and governments to address the problem. The issues and concepts underpinning commercial bushmeat hunting activities (as raised by different authors in the reviewed literature) were listed out and categorised into different themes. The dominant themes that emerged comprises rural livelihoods challenges and poverty, property rights struggles, unsustainable hunting techniques, public wildlife management problems, cultural influences, and population pressure. However, the severity of each of the above factors, differ from one country to another. Conservation programme strategies adopted by parks to address commercial bushmeat hunting challenges (e.g. integrated conservation and development projects), and authoritarian park protection measures (hinging on frequent arrest and punishment of hunters) are highlighted in the reviewed literature.

The paper reveals that parks and protected areas establishment in Africa are anchored on colonially nationalized forest lands of local communities, culminating in property rights struggles which have persisted from colonial era to the present day. Forest ownership claims and conflicts between park management and buffer zone communities have been a persistent source of violent confrontations in parks and protected areas across Africa. Rather than address the forest ownership / compensation demands of buffer zone communities (over nationalised territories hosting parks), several African parks have been investing in integrated conservation and development activities (which includes rural livelihoods), in the hope that such interventions will attract positive conservation outcomes from benefitting buffer zone communities. That has not really worked.

A key issue in African biodiversity conservation challenges is that Property rights contentions over nationalized park territories and call for sustainable compensation (payment of annual land rents) to communities, is continuously ignored by conservation authorities and governments. Parks cannot continue to serve global sustainable development objectives whose costs are borne by the world's poorest and marginalised people only. Current strict park protection efforts are insensitive to property rights contestations, and are therefore not yielding positive conservation results. Communities are now overtly and covertly engaging in commercial bushmeat hunting activities due to property rights arguments, and other ignored social impacts that attended the creation of most African parks. It may be instructive to note the World Bank's (2010:126) call for greater flexibility and sensitivity to the concerns and perspectives of communities already adversely affected by conservation initiatives

How conservation territories are acquired for biodiversity conservation purposes is very important and remains the first source of tension in parks – people's relations in African parks and protected areas. The territories hosting parks and protected areas in Africa were colonially nationalised by some European powers in the 19th and 20th century. Just as colonialism was stoutly resisted by African freedom fighters, culminating in the dismantling of colonialism in the second half of the 20th century, so have local communities been resisting the legitimacy of government ownership of the forestlands of parks and protected areas in post-colonial Africa. A major reason why local villagers continue to perpetrate hunting trespass into the territories of parks and protected areas in Africa is their enduring conviction that the forest lands of parks and rich biodiversity belong to them.

In post-apartheid South Africa, government entered into fresh negotiations with communities over hitherto nationalized forest territories of parks. Government recognition and revalidation of local people's property rights, contractual land agreement with communities, and payment of lease fees have stabilized the affected parks (Magome and Murombezi, 2003). The paper strongly recommends similar measures in all African parks experiencing commercial bushmeat hunting challenges. Though the existing literature attaches importance to livelihoods alternatives as mechanism of addressing commercial bushmeat hunting challenges, the paper however argues that payment of compensation (sustainably) or annual land rents to buffer zone communities (as landlords), hinging on conservation agreements vis-a-vis colonially nationalized forest lands (now parks), will address the problem more effectively in the long term, than current approaches. The paper recommends biological species inventories and wildlife surveys as research trajectories that can inform and determine other appropriate conservation strategies in parks experiencing commercial bushmeat hunting challenges in Africa.

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