

HUMAN-WILDLIFE INTERACTIONS, NATURE-BASED TOURISM, AND
PROTECTED AREAS MANAGEMENT: THE CASE OF MOLE NATIONAL PARK
AND THE ADJACENT COMMUNITIES IN GHANA

By

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of the Requirements for the Degree of

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Abstract

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Protected areas are increasingly becoming islands of habitat surrounded by seas of cultivation and development. Mole National Park, Ghana's premier park, has an emerging nature-based tourism that is not large when compared to park tourism in other African countries. The park attracts many tourists seeking to observe charismatic wildlife such as elephants. However, many of the species that are attractive to tourists can create problems for adjacent communities. The overarching focus of this study was on how human-wildlife interactions impact on nature-based tourism in order to inform tourism development in Mole National Park and in nearby communities.

The study was designed to address the following research questions: (1) How do human-wildlife interactions impact on nature-based tourism in Mole National Park and in nearby communities? (2) How do adjacent communities perceive the concerns and benefits of living near Mole National Park, and what factors explain the differences in perception of these concerns and benefits? and (3) How do park-adjacent communities perceive wildlife impact, and how are the perceptions of wildlife shaped by culture, involvement in a community conservation area, and a community's distance from the park? A variety of research instruments such as key informant interviews, focus groups, field observations, and surveys were used to gather data from tourists and the diverse range of communities that surround Mole National Park.

The study revealed high levels of tourist satisfaction with fundamental attractions such as wildlife and the environment. However, managerial deficiencies were noted in terms of infrastructure and services. CREMA (a variant of community-based natural

resource management) influence communities to have positive attitude towards the park and tolerate wildlife because of the benefits they gain or perceive they will potentially gain. Communities closer to the park although have concerns, rated benefits higher than communities farther away from the park. Cultural valuation of animals also influence people's interactions with wildlife. For example, taboo and totemic animals are revered and tolerated, not killed or eaten, although the same species may be considered problematic in other communities. Park ranger patrols, protecting water bodies, and livestock pens were rated as effective enhancement and mitigation measures of human-wildlife interactions.

Properly developed nature-based tourism in and around PAs can serve both conservation and development outcomes. However, the success of PAs as a conservation strategy depends to some extent on the support of the nearby communities. Park-adjacent communities' valuation of wildlife and the perception of concerns and benefits are important in the conservation process. Therefore, efforts should be made to ensure that concerns do not outweigh the benefits of living near PAs. Also tourism development in PAs should benefit nearby communities to offset the negative impacts of PAs on adjacent communities.

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Chapter 1: Introduction

1.0 Introduction

*“The problem of game management is not how we should handle the deer...
The real problem is one of human management.”*

Aldo Leopold

Humans and wildlife have interacted over millennia and in relation to diverse socioeconomic practices and societal scales. For example, human-wildlife interactions are evident in hunter-gathering, pastoralist, agrarian, and industrialist societies. With increasing human population and demand for limited resources, the interactions have overstretched wildlife and biodiversity in general. According to IUCN (2011), biodiversity loss is one of the world's most pressing crises and there is growing global concern about the status of the biological resources on which so much of human life depends. It has been estimated that the current species extinction rate is between 1,000 and 10,000 times higher than it would naturally be. Many species are declining to critical population levels, important habitats are being destroyed, fragmented and degraded as ecosystems are being destabilised through climate change, pollution, invasive species, and direct human impact. At the same time, there is also, a growing awareness of how biodiversity supports livelihoods, allows sustainable development and fosters co-operation between nations. Human interactions with wildlife are a growing concern globally in all areas where wildlife and human populations share natural resources (Woodroffe et al., 2005). The purpose of this study is to examine human-wildlife interactions and nature-based tourism in Mole National Park and the adjacent communities in Ghana.

A protected area (PA) is defined as “a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley, 2008, p.8). Protected areas are a core strategy for biodiversity conservation (Dudley, 2008; Rands et al., 2010). Mole National Park (MNP), located in Northern Ghana, is an IUCN category II protected area. Category II PAs have the objective of protecting large-scale ecological processes and the complement of species and ecosystems characteristic

of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities (Dudley et al., 2010). PAs are particularly significant for sustaining wildlife populations. Large mammal populations, for example, are often best conserved in landscapes where large PAs such as national parks are surrounded by buffer zones, connected by corridors, and integrated into a greater ecosystem (Nyhus and Tilson, 2004). Multi-use buffer zones, including those containing complex agroforestry systems, may provide both economic benefits to people and conservation benefits to wildlife. However, this situation often promotes increased conflict between humans and wildlife especially for communities adjacent to PAs.

Wildlife refers to both fauna and flora but would be restricted to wild animals in this study, to coincide with general use of the term by the tourism industry and the public. Wildlife therefore includes non-domesticated species of vertebrates such as mammals, birds, lizards, fish, turtles, as well as invertebrates such as glow-worms, butterflies, corals and starfish (Higginbottom, 2004). Human-wildlife interactions are one of the central components upon which nature-based tourism (NBT) in and outside PAs revolve (Duffus and Dearden, 1990). The interactions are varied and take place in different contexts and settings. People have different perceptions about wildlife and this affects the way people choose to interact with, or perceive the impact of, wildlife interactions and PAs. For communities that surround PAs, some of these interactions are positive whereas others are negative. On the other hand, for tourists interactions with wildlife may be the motivation to visit PAs. Understanding the variable dimensions of human-wildlife interactions in relation to diverse audiences such as local communities and tourists is necessary in the crusade toward wildlife and biodiversity conservation as well as improvement in the well-being of park-adjacent communities.

Tourism is one of the beneficial products of human-wildlife interactions. Tourism in PAs offers significant opportunities to local communities in the developing world. It can serve as a useful tool to reduce poverty (Morris and Vathana, 2003; Chok et al., 2007; Scheyvens and Momsen, 2008) while integrating conservation and development. Tourism can be categorized into mass tourism and alternative tourism. Mass tourism generally

involves large numbers of people visiting staged settings, such as resorts with the attraction-base often related to the “four s” of tourism: sea, sun, sand, and shopping (Dearden and Rollins 2009). The large numbers of people associated with mass tourism have implications for the environment and conservation. On the other hand, alternative tourism focuses on specific interest with smaller numbers of tourists in natural or cultural settings. NBT is one form of alternative tourism and includes all forms of tourism that use natural resources in a wild or undeveloped form, (including species, habitat, landscape, scenery, salt and fresh-water features) and takes place in natural settings which are an integral part of the attraction (Hall and Boyd, 2005; Rollins, Eagles and Dearden, 2009). It has different forms such as wildlife tourism, ecotourism, adventure tourism, and geo-tourism.

Nature-based tourism is a rapidly growing segment of the global tourism industry (Eagles, 2002; TIES, 2006; Kuenzi and McNeely, 2008; Balmford et al., 2009). The growth of nature-based tourism is significant for both the protection of biodiversity and generating financial resources for local communities (Zhao and Ritchie, 2007; Hammer and Siegrist, 2008; Balmford et al., 2009). A large portion of the world’s biodiversity is concentrated in developing countries (Olson et al., 2001; WWF 2001) that experience chronic poverty. The poverty situation may be exacerbated by PA wildlife through crop raiding and attacks on livestock which affect rural livelihoods. Yet, many of these biodiversity hotspots create tremendous benefits to local communities. These benefits include: foreign aid and integrated conservation and developments (schools and clinics), market access (road infrastructure), employment (PA staff positions), and tourism. The meta-analyses that have been done point to parks as being a solution to poverty and a magnet for the poor (Adams et al., 2004; Chok et al., 2007; Wittermyer et al., 2008; Andam et al., 2010).

As part of a programme to grow its share of tourism revenue, Ghana today presents itself as Africa’s gateway to the African diaspora, an image helped in no small part by the country’s status as a stable, English-speaking democracy (Stahl, 2010). The tourism industry is the third largest source of foreign exchange for the Ghanaian economy, with features such as forts and castles used during slave trade, the Pan-African Historical

Theatre Festival (PANAFEST), Emancipation Day celebrations, and the recent UNESCO sponsored Slave Route pilgrimage playing a major role (Kankpeyeng, 2009). Tourism has been a growing industry in Ghana's economy, accounting for seventeen percent of the country's Gross Domestic Product (Ghana Tourist Board, 2006). One of the first major formal steps in tourism development was an evaluation of the country's tourism resources in 1970 (Obuarn Committee, 1972). Since then there have been efforts to expand the industry. In 1993 the Ghana Government established the Ministry of Tourism to underscore its commitment to tourism development. A 15-Year Tourism Development Plan was developed for the period of 1996 to 2010. The goals and objectives of the plan have had mixed success. The target of having over one million international tourist visits was not realised, with 2010 recording 931,224 (Ghana Tourist Board, 2011). However, the one million target was achieved in 2011 when 1,087,000 million tourists visited Ghana (Ministry of Tourism, 2011).

Ghana's main tourism products are heritage tourism, based on cultural attractions related to the slave trade and nature-based tourism based on the country's diverse natural resource attractions. Ghana is blessed with a number of natural attractions such as nature reserves, national parks and its attendant wildlife, waterfalls including the Wli Falls, the highest waterfall in West Africa, coastal palm-lined sandy beaches, caves, mountains, rivers, a meteorite crater (Lake Bosomtwi), and the largest reservoir in the world by surface area (Lake Volta). However, nature-based tourism is not large compared to heritage tourism. Ghana appears to attract people who have some African ancestry. Among the most popular heritage tourism sites are the Three World Heritage Forts and Castles in Cape Coast and Elmina in the Central Region (Ghana Tourist Board, 2006). In 1992, the government established the bi-annual Pan African Festival (PANAFEST) and in 1998 an annual Emancipation Day celebration. These events have very successfully promoted Heritage Tourism in Ghana. Ghana was ranked the eleventh friendliest country in the world in 2011 ([Forbes Magazine](#), 2011). The assertion was based on a survey in 2010 of a cross-section of travelers. Ghana was the only African country to make the top 11 list. Reasons attributed to Ghana's ranking include the fact that tourism in Ghana is "driven by natural history, colourful festivals, historic sites and the hospitable people" ([Forbes Magazine](#), 2011).

Apart from the benefits of tourism, communities adjacent to parks enjoy hunting for bush-meat in communal lands if they acquire permission from Wildlife Division. Local communities around tropical PAs are mainly subsistence farmers and they depend on the land for their livelihood. Bush-meat has been one of their main sources of protein in the past and hunting for bush-meat is a major component of rural livelihood strategies in the tropical forest zone of West and Central Africa (Kümpel, 2010). In Ghana, local communities can obtain a licence from the Wildlife Division to hunt in community land during the open season. Although bush-meat is one of the sources of protein for communities around PAs, indiscriminate killing of wildlife including wholly protected, endangered, and rare species has negative implications for conservation. Also, illegal methods of hunting such as trapping, snaring, poisoning, hunting in the night, and flushing game with fire have consequences for both wildlife and the environment (GWD, 2002).

Other ecosystem services connected to wildlife conservation have positive impact on park-adjacent communities. These include: provisioning services like food and water; regulating of floods, droughts and reducing land degradation; and supporting soil formation, and nutrient cycling (Millennium Ecosystem Assessment, 2005). These ecosystem services provide inducements to live near PAs.

Cultural valuation of wildlife shapes human behaviours towards wildlife. Cultural valuation of wildlife results in different conceptualizations of wildlife globally. For example, to the Wasanipi Cree Indian hunters in sub-arctic Quebec, animals pursued by hunters were gifts that are like people, given to them by their god (Burch and Ellanna, 1994). To the Karam of the New Guinea Highlands, cassowaries, large ostrich-like or emu-like birds, were considered one's sisters or cross-cousins (Bulmer, 1967). To the Mount Gambier tribe of aborigines in Australia, all objects in the world were organized into clans, including the crow, pelican, and black cockatoo. To members of the clan, these totemic emblems were sacred beings, and all those within the clan were considered as kin (Durkheim, 1964). Sometimes the same animal may be seen differently by different cultures. Manfredo (2008) posits that views of the same animal can vary greatly across countries. For example, in Sri Lanka, Burma, Thailand, and Kampuchea, there is a

strong religious association with elephants, yet in China, there is no religious connection and elephants are exterminated as vermin (Sukumar, 1989).

In Ghana, cultural valuations of wildlife are manifest in taboos, totems, festivals, funerals, other traditional practices, and symbolism. For example, the sword that the Asantehene hold when being sworn into office is known as “*Mponponsuo*,” its name means “responsibility” and both hilt and blade are encased in a sheath of leopard skin decorated with gold. The leopard stands for power and bravery and the gold for wealth. The gold “*abosodee*” (sword ornament) is in the form of a gaboon viper holding a hornbill, which in this case symbolizes patience (Appiah, 1979). During occasions such as durbars (ceremonial gatherings) and funerals, animals are used in appellations for their special characteristics. The cobra is admired for its ability to reach places and to strike its enemy without being seen, an admirable military achievement. The baboon wanders over great distances and knows everything that goes on, a quality admirable in reconnaissance and the scouting in the army (Appiah, 1979). Some animals are also adopted as totems. The crested porcupine is the emblem of the Asante people and symbolizes their martial virtues. This identification was derived from its quills. It was promulgated as metaphor; as with the serried ranks of its defensive quills, so with the Asante soldiery-“*wokum apem a, apem be ba*” to wit, if you were to kill one thousand, one thousand more would come (McCaskie, 1992 p.225). In Asante’s animal classification, some animals are “*sasammoa*” meaning they possess spiritual power. These animals are considered dangerous because of their spiritual power. They include Maxwell’s duiker, royal antelope, waterbuck, bongo, elephant, yellow-backed duiker, black duiker, and roan antelope ((McCaskie, 1992). These animals are revered, and when a hunter kills one or one is seen dead, certain rituals have to be performed. In northern Ghana, skins of wild animals are used in the installation of chiefs (enskinment). The animals symbolize their traditional authority and therefore are revered. For example, Yagbonwura, the paramount chief of Gonja Traditional Area, and Wa Naa, the paramount chief of Wa Traditional Area, both sit on the skin of a kob (Conservation International, 2005). While the specifics of social valuations of wildlife vary across societies, it is foundational in shaping human-wildlife relations.

PA governance type also influences the perception of park-adjacent communities towards wildlife conservation and tourism. Community-based Natural Resource Management (CBNRM) is a form of governance with the potential to convince local rural people of the value and importance of wildlife protection and conservation (Koch, 2004). It allows local stakeholders to participate actively in the sustainable utilization and control of their natural resource which is important because community members who actually live in, and depend on, a given ecological niche have an interest in conserving that resource (Ukaga and Maser, 2004). In Ghana, Community Resource Management Areas (CREMAs) are a manifestation of CBNRM. A CREMA is “*any geographically defined area outside a protected area which is endowed with sufficient natural resources, and where communities have organised themselves for the purpose of sustainable resource management*” (GWD, 2004; MNP, 2005). The objectives of CREMAs are to promote the sustainable extraction of various harvestable botanical products/resources as well as promote conservation oriented activities that support the local economy (MNP, 1994).

Community proximity to PAs also influences community attitudes towards PAs, and related wildlife. For example, the proximity of farms to PAs and the presence or absence of neighbouring farms affects the likelihood of any farm sustaining crop damage from baboons (Hill, 2000). Generally, proximity of farms to the boundary line has been the strongest predictor of crop raiding by elephants (Naughton-Treves, 1998; Sam et al., 2005). However, communities on the edges of PAs enjoy an overall economic impact from PAs through integrated conservation projects, market access such as road infrastructure, employment (staff position and tourism) and enhanced ecosystem services (Wittermyer et al., 2008). These benefits draw people to communities on the edges of PAs.

Living near national parks can also generate concerns such as crop depredation, livestock attacks by wildlife, poaching by local communities and disease transmission to wildlife, livestock, and humans. Crop damage caused by raiding wildlife is a prevalent form of human–wildlife conflict along PA boundaries in the tropics (Naughton-Treves, 1998; Fungo, 2011). Wildlife that threaten crops, livestock or attack humans in tropical

PAs include: elephants¹, rodents, primates such as baboons and monkeys, carnivores like lions, leopards and hyenas (Nkanda and Parker, 2008; Mulu, 2010; Dickman, 2013) and cheetahs (Selebatso et al., 2008; Sillero-Zubiri et al., 2007).

Poaching is another concern and a major problem for conservation of wildlife populations in many parts of Africa. Poaching is driven by a number of factors including local demand for bush-meat and as a source of income for those living adjacent to PAs (Knapp et al., 2010). The high demand for bush-meat in West Africa and other parts of Africa (Wilkie et al., 2005; Brashares et al., 2004) is one of the major drivers for poaching activities. In Ghana, the demand for bush-meat has increased because it continues to be an important source of animal protein and over 80% of Ghanaians both rural and urban would consume it if available (Ntiemoa-Baidu, 1998). Poaching not only impacts wildlife with attendant implications for conservation but also affects communities. Although poaching may be carried out by only a small segment of the population, communities associated with poaching are branded and stereotyped. Such communities become the target of park law enforcement units and sometimes innocent people may suffer for the wrongful actions of a few.

Disease transmission from wildlife to livestock and humans is another concern that occurs in tropical PAs. Wild birds are important to public health because they can be infected by a number of pathogenic microorganisms that are transmissible to humans (Reed et al., 2003). Some authors contend that three fourths of all emerging infectious diseases of humans are zoonotic with most originating in wildlife (Taylor et al., 2001; Chomel et al., 2007; Jones et al., 2008). As the various interfaces between wildlife, domestic animals, and humans increase and become more complex, increased involvement with wildlife and diseases can be anticipated (Rhyan and Spraker, 2010). However, given the epidemiology and transmission pathways of some diseases, disease risks are unfamiliar to many people (Decker et al., 2010). Diseases can also be transferred from domestic animals to wildlife. For example, distemper from domestic dogs to wild carnivores such as lions, leopards and spotted hyenas (Butler et al., 2004) and rabies from domestic dogs to African wild dogs (Hofmyer et al., 2004).

¹ Appendix H: List of animals found in Mole National Park

To sum up, the consequences of human-wildlife interactions are varied and when negative interactions outweigh positive ones, it often leads to decreased support for conservation from park-adjacent communities. Conserving wildlife that damages crops and livestock, or attacks humans poses special challenges. Increased social conflict over wildlife issues is often born from value systems and perspectives about wildlife (Teel and Manfredi, 2010). Worldwide efforts to balance human needs with those of wildlife have generated much interest, and solutions are required that are scientifically sound and socio-politically acceptable (Treves et al., 2009). Accordingly, there is the need for examination of the way humans choose to relate with wildlife and the impact of wildlife on humans, especially in and around PAs.

1.1. Research Problem

Mole National Park, arguably the premier park in Ghana, started as Mole Game Reserve in 1958. (A detailed history of the park and the social setting of nearby communities is described in section 1.5). The park has an emerging nature-based tourism industry that is not large when compared to park tourism in many other African countries such as Tanzania (Wade, Mwasaga, and Eagles, 2001). There is much potential for the growth of sustainable NBT in Mole that can provide both conservation and community benefits. However, first, it is necessary to understand more about the current state of NBT in Mole. MNP attracts many tourists seeking to observe charismatic wildlife such as elephants. However, many of the species that are attractive to tourists that visit the park can create problems for adjacent communities with implications for sustaining rural livelihoods and impacting on poverty. Although national parks are very important in conservation of biodiversity resources particularly in developing countries such as Ghana, the success of national parks as a conservation strategy depends on the support of the nearby community. If the cost to adjacent communities of living near national parks is excessive, compared to the benefits, community support for conservation may decline and anti-conservation behaviours such as poaching may arise. The concerns and benefits may differ due to a community's distance from the park boundary, PA governance arrangement, and cultural perspectives based on the traditional areas.

1.2. Research Questions

The study examines human-wildlife interactions in Mole National Park and the adjacent communities to generate knowledge about their distribution, dynamics, and impact on the adjacent communities, and on tourism within and outside the park. The study addresses the following questions:

1. How do human-wildlife interactions impact on nature-based tourism in Mole National Park and in nearby communities?
2. How do adjacent communities perceive the concerns and benefits of living near Mole National Park, and what factors explain the differences in perception of these concerns and benefits?
3. How do adjacent communities perceive wildlife impact, and how are the perceptions of wildlife shaped by culture, CREMA involvement, and a community's distance from the park?

1.3. Theoretical Approach

This research is situated primarily within two theoretical frameworks: the Behavioral Approach Model and Social Exchange Theory. The Behavioural Approach Model is used to understand tourism behavior, and proposes that people engage in specific leisure activities in certain settings to fulfil motivations and realize a group of benefits that are known, expected and valued. If the outcomes of these expectations turn out as expected in terms of motivations, the person would be satisfied with the experience and a feedback loop might result in the person seeking similar experiences in future or providing positive feedback to other tourists who may consider visiting the area (Needham and Rollins, 2008). Understanding visitor motivations for participating in a given activity and assessing how well the activity meets those needs is critical for the successful management of a wildlife tourism site (Ziegler, Dearden and Rollins, 2011). Visitor satisfaction is identified as one of the research gap areas in park tourism which is important for the sustainable future of many parks and PAs (Eagles, 2013). Satisfaction with the experience of nature-based tourism is based on two fundamental components: “(1) appropriate levels of environment quality, and (2) suitable levels of consumer

service” (Eagles, 2002, p.132). Return visitation and positive reports to others require good levels of visitor satisfaction with park environments, facilities, and programs (Eagles, 2013).

Social Exchange Theory is used in this study to explore the attitudes toward wildlife held by people living in communities near to Mole National Park. Considerable poverty exists in communities near PAs in Ghana which may be exacerbated by the activities of PA wildlife in terms of crop depredation and livestock attacks which affect rural livelihoods (Patterson et al., 2004; Namgail et al., 2007). Yet, meta-analyses that have been done based on examples from many parts of the world point to PAs as having an overall positive economic impact on park adjacent communities, especially over longer time periods (Adams et al., 2004; Chok et al., 2007; Wittermyer et al., 2008; Andam et al., 2010). Within this context, social exchange theory is used in this study to assess how communities perceive the impacts of PAs and wildlife conservation. Social Exchange Theory postulates that an individual’s attitudes toward conservation, and subsequent level of support for it, will be influenced by his or her evaluation of resulting benefits and concerns. Perceptions of the exchange can differ from person to person in that an individual who perceives a positive outcome will evaluate the exchange in a different way than an individual who perceives it negatively.

1.4. Conceptual Framework of the Research

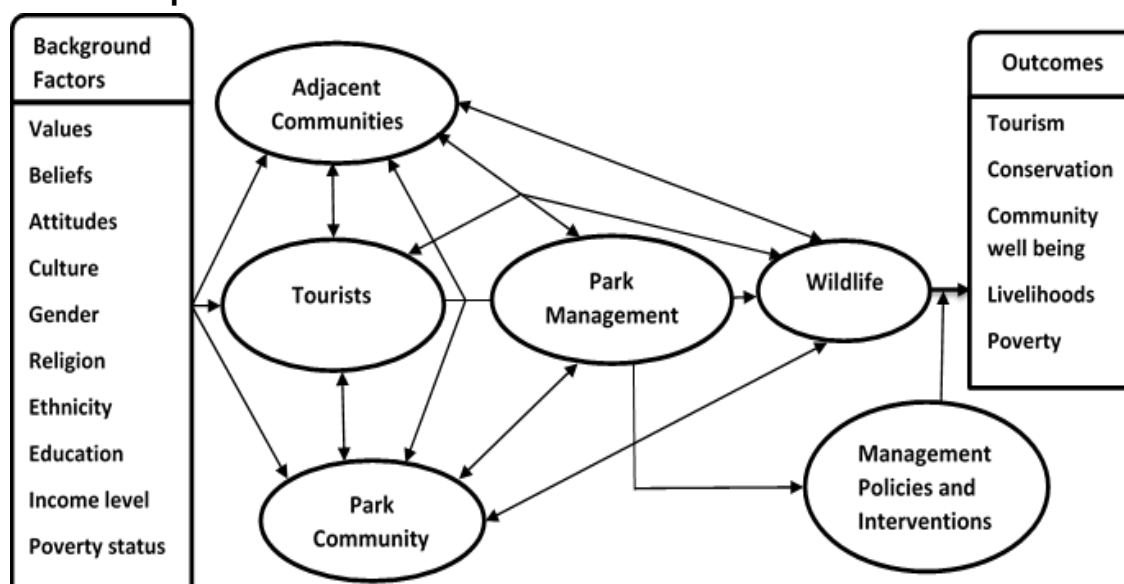


Figure 1: A Conceptual Framework of Human-Wildlife Interactions in and around Mole National Park

In Mole National Park and the surrounding communities, there is a complex network of interactions between wildlife, tourists, the park community, and the adjacent communities (Figure 1). Tourists interact with wildlife and with some nearby communities. The park community interacts with wildlife daily and also with the adjacent communities. Wildlife also moves in and out of the park and interacts with the park community, tourists, and the adjacent communities in various ways. Some of these interactions are positive, such as tourism which raises support for conservation and cultural values for local communities. The interactions could also be negative, such as crop depredation, attacks on livestock, disease transmission to human and livestock, and even attacks on humans. Management policies and interventions seek to control and influence the outcomes of the interactions. The interactions could lead to both positive and negative outcomes in the form of conservation, tourism, community well-being, livelihoods, and poverty.

1.5. The Study Area

Mole National Park is Ghana's largest protected area. Situated between Wa and Tamale, it covers about 4,577 km² (Figure 2) and lies between 9° 11' and 10° 10' N latitude, and 1° 22' and 2° 13' W longitude (MNP, 2011). It was gazetted as a national park in 1971 for its outstanding wildlife and also to protect representative ecological habitats.

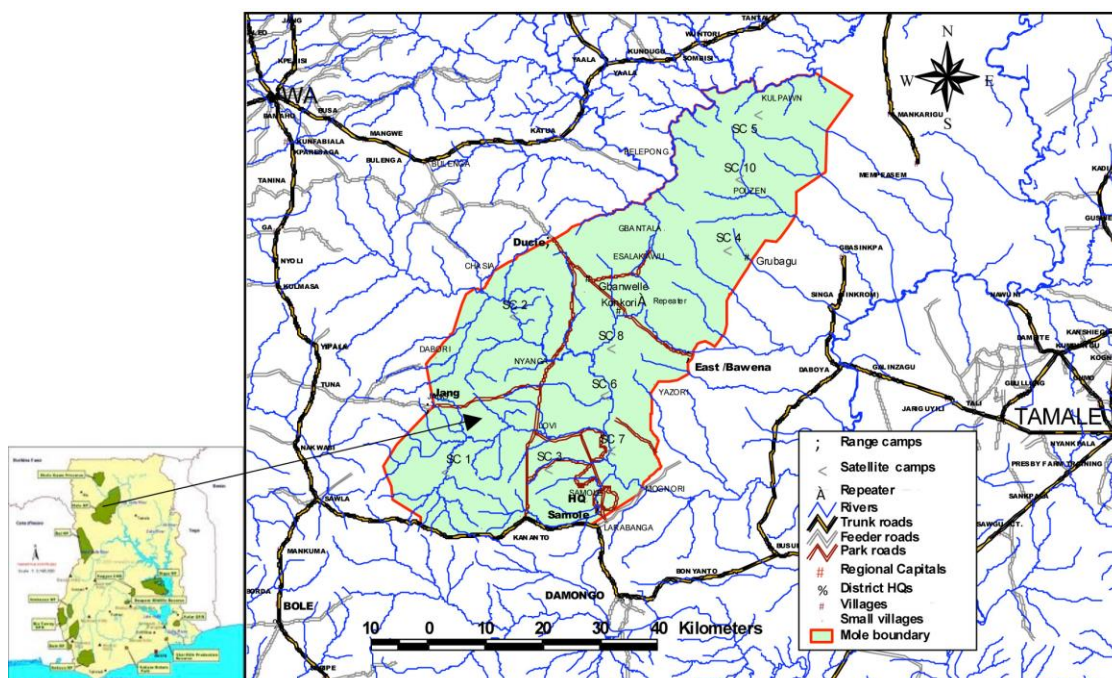


Figure 2: Map of Mole National Park, Ghana

Visitors can usually see a range of species including elephants, hartebeests, kobs, waterbucks, bushbucks, warthogs, roan antelopes, duikers, buffalos, oribis, baboons, patas monkeys, vervet monkeys, red-throated bee-eaters, Abyssinia ground horn-bills, saddle-billed storks, agama lizards, crocodiles, bush snakes and other species (MNP, 2011). The list of animals that can be found in the park is in Appendix H.

The average annual rainfall of the Mole ecosystem is about 1100 mm. More than 90% of the rain falls in the rainy season from April to October, with peaks in July and September. The dry season lasts from November to March. The mean annual temperature of 28°C varies from 26°C in December to 31°C in March. The average range from day to night is 13°C. It can be unpleasantly hot in March and April, with temperatures sometimes in the 40°Cs. The Harmattan (a dry wind from the Sahara) blows during December to February bringing dusty, hazy weather conditions. The relative humidity reaches 90% at night during the rainy season and falls to about 70% in the afternoons. In the dry season, the figures drop to 50% and 20% respectively (MNP, 2011).

People have been living in the Mole area for hundreds of years before the establishment of the park, and probably for much longer. It is thought that the Larabanga

Mosque was built by Moorish traders in the 14th century. The building houses a Quran which is said to be as old as the mosque itself. By 1870, the Mole area was fairly heavily populated by the Bole division of the Gonja tribe. Following a dispute over the succession of the Gonja Paramount Chieftaincy, a long war broke out between the Kong and Bole divisions of the Gonja polity. The Kong people then sought the help of two infamous slave raiders – Samori from Guinea and Babatu from Côte d'Ivoire. These two groups massacred a large number of people before they themselves were defeated at the Battle of Jentilpe. The Bole division eventually won the war, but the area had become depopulated. The remaining people then congregated in a few small villages and lived by hunting and cultivating small farms. Cattle could be kept only in one or two areas because of the presence of tsetse flies, the insect vector of trypanosomiasis (sleeping sickness). By the 1870s, the Gonja people had become the dominant ethnic group in the area after defeating all other groups in inter-tribal wars. As a result, the majority of the people in the area still live under the Gonja sovereignty. In 1943, the Paramount chief of the Gonja traditional area, Yagbonwura, moved his seat of office from Nyenge to Damongo. A large retinue went with him and the size of the village increased considerably (MNP, 2011).

In the 1930s, the British Colonial Administration designated some 2300km² of the present park as a Game Clearance Area in an effort to control tsetse flies. The aim was to clear the area of wildlife so that the tsetse flies would have no food and would die out. Habitat was also cleared along rivers and streams. Large numbers of antelope and buffalo were shot but fortunately the policy of game clearance was abandoned in 1957. In 1958, the Mole Game Reserve was established, enclosing some traditional hunting grounds and sacred sites. Six villages were included and as the area was a traditional Gonja hunting ground, hunting camps were widely scattered within the reserve. In 1964, the evacuation of villages as a result of PA establishment began with the assistance of other government agencies and more than 500 people were removed. Nyanga, the largest village in the middle of the reserve, was the last village to be evacuated (MNP, 2011).

Mole was legally gazetted a National Park in 1971 under the Wildlife Reserve Regulations (LI 710) and its area was enlarged to 4554km² by extending the boundaries

north to the Kulpawn River and eastward over the Konkori escarpment. In 1992, the Park was further enlarged to its present size of about 4577 km² with the addition of the Gbantala triangle. The villagers from Gbantala were relocated and compensated at the end of 1992 (MNP, 2011). Although compensation has been paid to communities whose lands were taken for the creation of the park and villages that were evacuated from the park and resettled, some people still have issues with the establishment of the park. The compensation that was paid may not have trickled down to households but remained with the chiefs and the community elite. There are also generations who have no idea about how the compensations were used. All these factors have influenced perceptions of the park by the adjacent communities.

The communities surrounding Mole National Park are found in three traditional areas which are Gonja, Wa and Mamprusi. The traditional territories are headed by paramount chiefs who have divisional chiefs and village chiefs under them. The local chiefs administer the affairs of the villages assisted by local elders. The village chief reports to the divisional chief who in turn reports to the paramount chief. The communities are multi-ethnic with several languages. Almost all the ten communities in which the study was conducted had more than one dominant language except two: Zanwara (which is 100% Mamprusi and speak Mamprusi language) and Larabanga where Kamara is the main language. Ten different languages are spoken in the ten communities that the research was conducted in although some of the languages are common to the communities. For example, Gonja is common in most of the Gonja communities. The communities around the park are mainly peasant farmers, who also rear livestock, hunt, and gather wild fruits and other NTFPs. There are 33 communities around the park with a population of about 40,000 people, who make use of the park's resources in diverse ways (MNP, 2011).

1.6. Methods

In this research, a case study approach was used. Yin (2009) defines case study as “empirical enquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used.” (p. 13). Case studies explain,

describe or explore real-life situations that have no clear single set of outcomes. Key informant interviews, focus group meetings, field observations and surveys were completed in order to provide rich data and triangulation through converging lines of inquiry (Yin, 2009). Details of the methods are provided in chapters 2 and 3 of the thesis.

The research was reviewed and approved by the University of Victoria Human Research Ethics Board prior to field research (Appendix A). Informed consent for participation in the research was acquired through signing and verbal agreement (Appendix C). Key informant interview guide, focus group guide, and surveys are attached as appendixes. The study was carried out from November, 2011 to November, 2012.

The data-set collected was coded and analyzed using IBM SPSS version 21 and Office 2013 Microsoft Excel. Parametric test such as ANOVA, independent sample student t-test, and Chi-Square were used to show statistical significance between the variables. Although some authors argue that data generated through Likert Scales may not be normally distributed and are non-parametric (Conover, 1981; Vaske, 2008), test for normal distribution was carried out and the curves showed that the mean scores were within or skewed toward the modal scores and as such are representative of the population. Hence, parametric tests were used.

1.7. Thesis Structure

The results of the study are organized into three papers which are discussed in detail in the next three chapters to give a picture of how humans such as tourists and local communities interact with wildlife under different circumstances. Chapter Two addresses the first research question under “Human-wildlife interactions and nature-based tourism in Mole National Park.” The chapter gives an overview of the state of tourism in Mole and how the adjacent communities can benefit from the tourism industry.

Chapter Three answers research question two which addresses the concerns and benefits of park-adjacent communities. This chapter shows how local communities perceive concerns and benefits of living near the protected area. The chapter explores the factors that explain the variability of perceptions in different communities such as

CREMA involvement, traditional affiliations and proximity to the park. The chapter shows how the perceptions of the communities are related to conservation.

Chapter Four addresses the third research question which relates to the impact of wildlife on park-adjacent communities. The chapter highlights valuations of wildlife species by adjacent communities and how this valuation shapes the way people interact with wildlife. The chapter also discusses effective strategies of enhancing or mitigating human-wildlife issues.

Chapter Five provides general conclusions which summarize the key findings of the study and situate it in broader literature. The chapter then looks at the implications of the findings to draw conclusions. The chapter continues with contributions of the research as well as recommendations for managing human-wildlife issues. The chapter ends with suggestions for future research and provides concluding remarks.

References in individual chapters are put together as a bibliography at the end of the thesis. The ethics certificate, the key informant interview guide, the focus group guide, survey instruments and list of animals in Mole National Park are provided as appendices at the end of the thesis.

Chapter 2: Human-Wildlife Interactions and Nature-Based Tourism in Mole National Park, Ghana

2.0 Abstract

Mole National Park in Ghana has an emerging nature-based tourism (NBT) that is not large when compared to park tourism in other African countries. This paper examines human-wildlife interactions and nature-based tourism in Mole. The impact of the interactions on tourism was studied using key informants, focus groups and surveys.

Tourists showed high levels of satisfaction with fundamental attractions like wildlife, however, many infrastructure deficiencies were also noted. Seeing wildlife, being close to nature, and enjoying views are the top motivations for tourist visitation. The majority of the tourists had positive attitude towards wildlife and the species that impact positively on tourists are elephants, monkeys, antelopes, and warthogs. Tourists' experiences were highly influenced by the guided tour and wildlife scored very highly as well as most attributes of the walk itself. However, discussion of local Ghanaian cultural heritage was rated very low. The majority of the tourists were first time visitors.

Communities adjacent to the park perceive wildlife impact negatively due to the losses they suffer mainly from crop and livestock depredation. The species that impact most negatively are hyenas, patas monkeys, and partridges. Elephants, the flagship species of Mole, are also involved in crop depredation in nearby communities. The majority of adjacent communities want to be marketed as a tourism destination and have various products such as farm tours, homestays, and cultural performances to offer.

Tourism in Mole has the potential for expansion but the growth of tourism needs to be guided in order to protect the ecological integrity of the park. Management should provide refresher training programs for tour guides to enhance tourist satisfaction. Adjacent communities with tourism potential in terms of rich culture and other attractive features should be assisted to re-package themselves to take advantage of the growing tourism industry.

Keywords: Human-wildlife interactions, Mole National Park, Nature-Based Tourism

2.1 Introduction

Tourism is one of the beneficial products of human-wildlife interactions in and around protected areas (PAs) as wildlife viewing is one of the major motivations for people to visit national parks. Human interactions with wildlife occur across a wide variety of contexts and often form the central components of nature-based tourism (NBT) operations (Duffus and Dearden, 1990). This study assesses human-wildlife interactions and nature-based tourism in Mole National Park (MNP), Ghana.

PAs are a core element of biodiversity conservation (Dudley, 2008; Rands et al., 2010). Tourism in PAs offers significant opportunities to local communities in the developing world to act as a useful tool to reduce poverty (Morris and Vathana, 2003; Chok et al., 2007; Scheyvens and Momsen, 2008) while integrating conservation and development. NBT in PAs has become increasingly significant not only for protecting biodiversity but also for generating financial capital from a range of services (Zhao and Ritchie, 2007; Hammer and Siegrist, 2008; Balmford et al., 2009)

Tourism can generally be categorized into mass tourism and alternative tourism. Mass tourism generally involves large numbers of people visiting staged settings, such as resorts with the attraction base often related to the “four s” of tourism: sea, sun, sand, and shopping (Dearden and Rollins 2009). The large numbers of people associated with mass tourism have implications for the environment and conservation. On the other hand, alternative tourism focuses on specific interest with smaller numbers of tourists in natural or cultural settings. NBT is one form of alternative tourism and includes all forms of tourism that use natural resources in a wild or undeveloped form, including species, habitat, landscape, scenery, salt and fresh-water features and takes place in natural settings which are an integral part of the attraction (Hall and Boyd, 2005; Rollins et al., 2009). It has different forms such as wildlife tourism, ecotourism, adventure tourism, and geo-tourism.

NBT such as geo-tourism has a link with landmarks of slave route tourism. Building on the UNESCO ‘Slave Route’ initiative, the Ghana government promotes heritage tourism centered on the slave forts and castles of the coast, but more recently has endeavoured to extend tourism to the interior by “reconstructing” a slave route that

enables tourists to 'retrace' the steps of slaves as they moved from the interior to the coast (Stahl, 2010 p. 259). There are efforts to incorporate northern Ghana slave sites into the framework of pilgrimage tourism and thereby offer them to the African Diaspora audience (Schramm, 2007). There has recently been a study initiated by UNESCO on the slave trading route that ran across Mole which followed the line of the road from Ducie to Bawena as well as several caves in the park, some of which were used by slave raiders (MNP, 2011). When this is developed, it could help attract the Diaspora community to boost tourism in Mole.

NBT is a large and a fast growing segment of the global tourism industry (Eagles, 2007; TIES, 2006; Kuenzi and McNeely, 2008; Balmford et al., 2009). Although there have been reported declines in some developed countries, particularly in North America and Japan, Balmford et al., (2009) argue that the growth of NBT in developing countries is very appreciable. This growth is significant in generating money for developmental purposes and biodiversity conservation in developing countries where a large portion of the world's biodiversity is concentrated (Olson et al., 2001; WWF 2001). These biodiversity hotspots are the focus of conservation efforts, but at the same time these areas are located in regions of the developing world that are experiencing chronic poverty. In fact, in the developing world, many national parks create a negative impact on the livelihood of surrounding communities such as crop depredation from national park wildlife (e.g. by elephants) and attacks on livestock by park wildlife (Naughton-Treves, 1998; Patterson et al., 2004). Yet, many of these biodiversity hotspots create tremendous benefits and in fact, the meta-analyses that have been done point to parks as being a solution to poverty and a magnet for the poor (Adams et al., 2004; Chok et al., 2007; Andam et al., 2010).

In the context of tourism, issues with the concept of sustainable development, including its relationship with carrying capacity, with control of development and operation, and with mass or conventional tourism is key in managing tourism challenges (Butler 1999). Although expanded tourism has its own associated problems, nature-based tourism, if properly developed, can provide economic benefits to nearby communities, to offset these kinds of negative impacts. Research about nature-based tourism has received

significant attention in established nature tourism destinations throughout the developed world, and in many developing countries, but not as much attention has been directed in less established nature tourism destinations, such as in West African regions, including Ghana. To address these interrelated issues of conservation and poverty reduction, it is imperative to develop a better understanding of sustainable development, particularly nature-based tourism.

One approach for understanding nature-based tourism is “the Behavioural Approach Model.” This model proposes that people engage in specific nature-based recreation activities in certain settings to fulfil motivations and realize a group of benefits that are known, expected and valued. If the outcomes turn out as expected, the person would be satisfied with the experience and a feedback loop might result in the person seeking similar experiences in future (Needham and Rollins, 2008). Understanding visitor motivations for participating in a given activity and assessing how well the activity meets those needs is critical for the successful management of a wildlife tourism site (Ziegler et al., 2011). In tourism, motivation explains why people travel, and is a key component and a driving force behind tourist behaviour (Crompton, 1979; Hsu and Huang, 2008). The literature suggests that push-pull theory is a dominant paradigm for understanding motivations in tourism research (Dann, 1977; Crompton, 1979; 2005; Prayag and Ryan, 2011). Push factors are mostly intrinsic, emotional factors and include a desire to get away, adventure, excitement, rest, relaxation or social interaction, while pull factors are mostly extrinsic, site or activity specific and include recreational opportunities, cost, safety, natural scenery, cultural attractions, facilities and infrastructure (Uysal and Jurowski, 1994; Park and Yoon, 2009; Devesa et al., 2010).

Satisfaction is the primary method used to measure the quality of a visitor’s experience (Tonge and Moore, 2007). Visitor perceptions of the quality of a tourist destination, satisfaction with their experience and the resulting behavioural intentions are vital for successful destination management and marketing (Žabkar et al., 2010). If the visitor’s experience is understood, managers can provide services and infrastructure that meet visitor expectations, as well as confirm that visitors are satisfied with the experiences provided (Hornback and Eagles, 1999). Increased knowledge of the tourists

in terms of expectations, motivations and satisfactions allows for effective management (Duffus and Dearden, 1990) in the context of NBT to ensure protection of wildlife and conservation. Visitor satisfaction is noted as one of the research priorities in park tourism (Eagles, 2013).

Mole National Park, the largest protected area in Ghana, has an emerging NBT industry. Visitor numbers have been increasing steadily for the last 15 years at a growth rate of at least 10% per annum since 2001 and currently the park receives about 16,000 visitors a year (MNP, 2011). However, the industry is not large when compared to park related tourism in other African countries. There is much potential for the growth of sustainable NBT at Mole that can provide both conservation and community benefits. However, first, it is necessary to understand more about the current state of NBT in Mole. This study examines human-wildlife interactions and nature-based tourism in MNP. In particular, it addresses the following research questions:

1. What are tourist motivations for visiting MNP?
2. What are the perceived impacts of different wildlife species on tourists, and on communities adjacent to the park?
3. Do tourist experiences meet their expectations, and how do guided tours influence tourist experiences at MNP?
4. What is the response of tourists to experiences in MNP?
5. How can adjacent communities benefit from tourism in MNP?

2.2 The Study Area

Mole National Park is Ghana's largest protected area. Situated between Wa and Tamale, it covers about 4,577 km² (Figure 1) and lies between 9° 11' and 10° 10' N latitude, and 1° 22' and 2° 13' W longitude (MNP, 2011). It was gazetted as a national park in 1971 for its outstanding wildlife and also to protect representative ecological habitats.

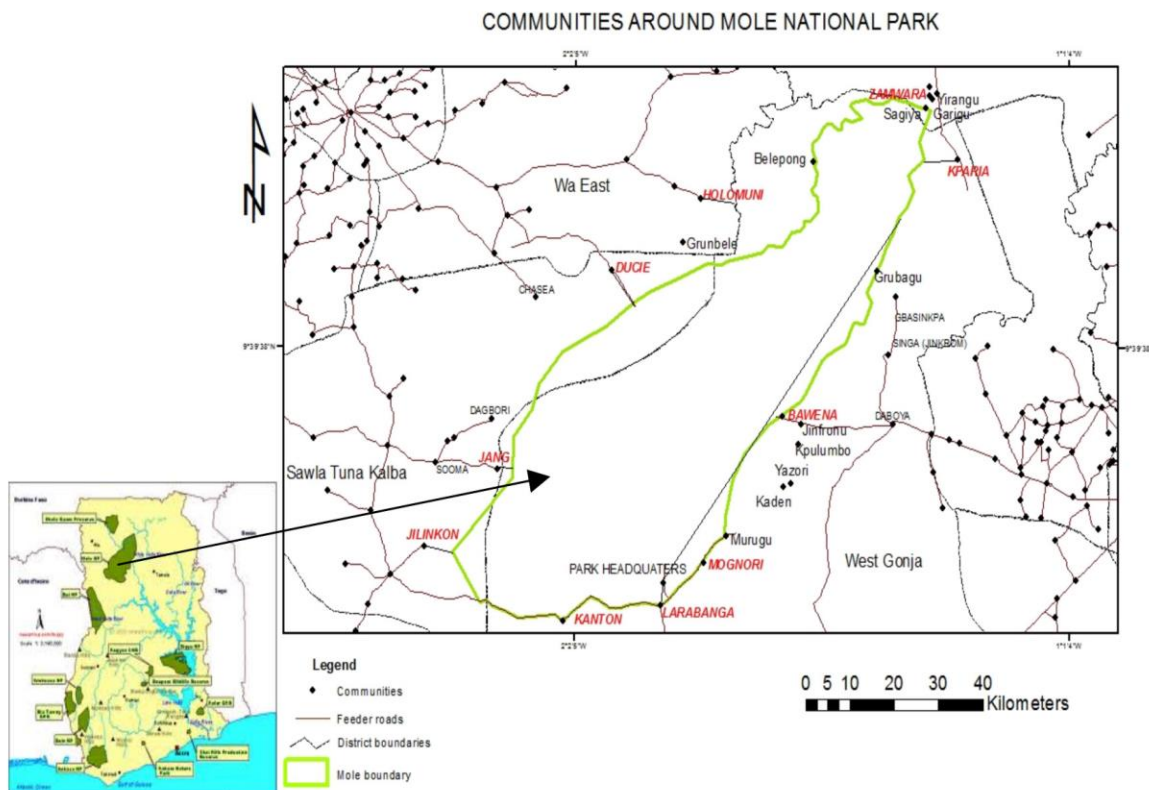


Figure 3: Map of Mole National Park, Ghana

Access to the park is either by road of varying condition involving a day journey from the capital Accra or by air from Accra to Tamale and from Tamale to Mole by road. The park has one main entrance which is the headquarters through Larabanga community. The main source of accommodation for park visitors is the 87-bed Mole Motel which is located close to the park's main entrance, on the edge of the Konkori Escarpment. The Motel overlooks a reservoir created by a dam and a large section of the park. It has a small restaurant and a bar and a medium-sized swimming pool. The Motel has a reasonably reliable electricity supply and a satisfactory water supply from a borehole (MNP, 2011). It is jointly owned by Ghana Government and a private venture. The Motel staff are therefore not part of the Mole National park staff. There are also various simple guest-houses in Damongo 23km from the park and Larabanga 6km from the park headquarters.

Visitors can usually see a range of wildlife species including elephants, hartebeests, kobs, waterbucks, bushbucks, warthogs, roan antelopes, duikers, oribis, baboons, patas monkeys, vervet monkeys, red-throated bee-eaters, Abyssinia ground

horn-bills, saddle-billed storks, agama lizards, crocodiles, bush snakes and other species (Appendix H). The distribution of wildlife is not evenly distributed. For example, elephants are common and found more in the southern lowlands (Appendix H).

Wildlife viewing appears to be the main attraction of the park. Wildlife such as baboons, kobs, warthogs and elephants can be seen around the motel. There are two reservoirs created by dams in the park below the escarpment to the west of the Motel that provide excellent wildlife viewing from the motel, especially in the dry season. Crocodiles and many birds can be seen there and elephants often spend hours in the water each day. Some tourist enjoy relaxing at the viewing site near the Motel and watch wildlife activity in the reservoir created by dam below.

However, for those tourists who wish to experience the park outside of the immediate Motel area, the park provides daily guided walking tours and a drive safari. The guided tours are usually conducted early in the morning and late afternoon. There is also a tree hide and three viewing platforms at strategic locations where visitors can sit and watch wildlife in comfort.

There are small tourist camps at Lovi Camp, about 32 km from the park headquarters and Brugbani about 9km which could be used by visitors who want to experience the real wilderness (MNP, 2011). Two spectacular waterfalls: Polzen and Kparia are located in the north-eastern of the park. Although difficult to access, tourists could be driven through the boundary line to the falls during the dry season (January to March) after the early burning.

There are 33 communities that surround the park (Figure 3). The communities occupy three traditional areas: Gonja, Wa, and Mamprusi. The communities are multi-ethnic with several languages. In most of the communities more than one dominant language is spoken and people of the same ethnicity and language aggregate together. The communities are headed by local chief who report to the divisional chief and the divisional chief to the paramount chief. The community members are mainly subsistence farmers. Some of the communities have community resource management areas (CREMA). A CREMA is *“any geographically defined area outside a protected area which is endowed with sufficient natural resources, and where communities have organised themselves for the purpose of sustainable resource management”* (GWD,

2004; MNP, 2005). Ten communities were selected for the study based on their traditional affiliations, proximity to the park, and CREMA involvement (Table 1).

Table 1: The list of communities selected for the study

Community	Traditional Area	Non-CREMA (No) CREMA (Yes)	Distance from the park (km)	Coordinate(W)	Coordinate (N)
Kananto	Gonja	No	0.1	2°3'33.546"	9°11'36.599"
Larabanga	Gonja	No	0.2	1°51'39.924"	9°13'16.121"
Bawena	Gonja	No	0.2	1°36'38.067"	9°32'49.487"
Mognori	Gonja	Yes	0.3	1°46'13.009"	9°17'43.702"
Zanwara	Mamprusi	No	2.6	1°18'31.521"	10°5'49.523"
Jang	Gonja	No	3.8	2°11'41.366"	9°27'18.661"
Jelinkon	Gonja	Yes	6.9	2°20'49.985"	9°19'15.15"
Holomuni	Wa	No	7.9	1°46'44.432"	9°55'8.947"
Kparia	Gonja	No	8.0	1°14'54.492"	9°59'12.688"
Ducie	Wa	No	8.5	1°57'45.961"	9°47'51.209"

The communities are not evenly distributed in the three traditional areas. Over 70% of the communities are in Gonja whereas Mamprusi has the least number of communities, only four. Subsequently, seven of the communities selected were from Gonja, two from Wa, and one from Mamprusi to reflect the differences in number of the communities in the traditional affiliations. Also there are two functional CREMAs around Mole. These two functional CREMA communities: Jelinkon and Mognori were selected by default because of their CREMA involvement. The communities were also selected to reflect their spatial location around the park. So in terms of their proximity to the park the communities were selected to ensure that they are distributed around the park.

2.3 Methods

A case study approach using both qualitative and quantitative methods was used. Key informant interviews, focus group meetings, field observations and questionnaire surveys were completed in order to provide rich data and triangulation through converging lines of inquiry (Yin, 2009).

2.3.1 Key informants

Key informants were used to gather primary information from park staff and motel staff relating to human-wildlife interactions and NBT in the park. Information on tourism products and services, the key human-wildlife interactions, the flagship species, tourist motivations, and management plans were obtained from key informants. Four key informant interviews were conducted using a semi-structured interview guide and lasted for about 45 to 90 minutes. Information gathered from the key informants was followed by focus group meetings.

2.3.2 Focus groups

The focus group meetings were a follow up to the key informant interviews. The issues raised by the key informants were discussed at a group level. The participants for the focus group meetings were of mixed gender and represented different age groups of both international and domestic tourists. The participants were recruited at the information center or the motel and each group composed of 5-8 participants to allow for effective discussion. Two focus group meetings were held involving the international and domestic tourists using a semi-structured interview which lasted for about 45-90 minutes. The information gathered from the key informants and the focus group meetings were corroborated through field observations.

2.3.3 Field observations

Field observations were used to verify the information gathered from the key informants and the focus groups. This included both car and foot safaris, walking, and driving through the park. Notes were made of tourism products and services, tourist numbers per safari, underutilized potential, and environmental degradation. Photographs of human-wildlife interactions were taken as well. The information gathered from the key informants, focus groups and field observations was used to refine the survey.

2.3.4 Tourists survey

The tourists survey (Appendix F) was used to sample the views of the broader tourist community on the issues raised by the key informants and the focus groups. The questionnaires comprised mainly closed-ended questions and were divided into sections. The first section included the number of times the respondent had visited the park and

how he/she heard about the park. The second section addressed tourists' motivation for visiting the park, the third and fourth sections deal with satisfaction with experience at Mole and how a guided tour influenced their experience respectively. The fifth section looked at tourists' responses to their experience in Mole and the final section asked questions regarding demographics. The questionnaire was first pre-tested with small numbers of tourists and further refined before the actual survey.

Respondents were recruited from a cross-section of tourists visiting the park. A list of tourists who have already been on a guided tour was obtained from the tourism unit. Survey participants were then randomly selected at the information center and the motel and questionnaires given out for them to fill. For tourists who were not fluent in English, the researcher read the question to the respondents and filled out the resulting answer. In some cases, questionnaires were given to the tourists to complete and collected before they checked out of the motel. Both international and domestic (national) tourists were surveyed. The principal researcher and three research assistants/supervisors conducted the survey from January 2012 to November 2012. Four hundred and sixty-five questionnaires were issued and 350 were completed representing a response rate of about 75%. The target was to complete 350 surveys, so the questionnaires were sent out until the target was reached. A response rate of 60% can be considered sufficient in accurately representing the population being sampled (Dolsen and Machlis, 1991) while 70% is considered very good (Babbie, 2012).

2.3.5 Adjacent community survey

Household survey (Appendix G) was used to sample the views of the adjacent communities on the impact of wildlife and how the communities can benefit from tourism. The questionnaire was developed from literature and the information gathered from key informants, focus groups and field observations was used to refine the questionnaires for the survey. The questionnaires were made up of mainly closed-ended questions that were pre-tested in two communities and further refined before the actual survey.

Prior to the data collection, the principal researcher, Protected Areas and Poverty Reduction (PAPR) project community coordinator, and Deputy Park Manager, Mole paid

a courtesy call to the Yagbonwura, the paramount chief of the Gonja Traditional Area and explain the nature of the research to him and his elders. The Yagbonwura issued letters to all the seven Gonja communities where the study was conducted for cooperation and assistance in the cause of the study. In each community, the chief's palace was visited first, gifts presented, and the research mission explained. A message was then sent by the chief to the whole community about the study and this made the respondents very receptive to the survey.

Three research supervisors/assistants, one from each of the three traditional areas were recruited and trained to help with the field research. An additional twenty research assistants (two teachers from each community) were recruited to cater for the different languages in the ten communities and trained to conduct the survey. The teachers were natives of the local communities. As part of the training, the research assistants were asked to answer the questionnaires themselves and this was followed up by a debriefing with the principal researcher. In total the research team consisted of 24 people: the principal researcher, three research supervisors, and 20 research assistants (two school teachers in each community). The research supervisors and research assistants were trained by the principal researcher. In addition, daily debriefing was conducted to ensure quality control during the administration of the survey questionnaires.

The strategy of using school teachers as research assistants for the community survey was for three reasons. First, the principal researcher could communicate in English with the teachers. Second, the teachers could speak and translate into the local languages spoken in each community. Third, the teachers were known and respected in the community, which allowed for high response rate.

In each community the respondents were selected by first stratifying the community according to the settlement patterns which was along the major language groups. Then within each stratum, a household inventory was taken and the respondents randomly selected from age cohorts and gender. The (two teachers) research assistants from each community were supervised to conduct the surveys. The research assistants read the questionnaire to the respondents and filled out the resulting answers which lasted for about 30-60minutes. There were daily debriefing to resolve outstanding issues before

the next day. Fifty questionnaires were completed in each of the ten communities culminating in 500 surveys. In some communities more than 50 people were approached before the 50 per community target was reached. However, generally the community participation was high, about 90% of the people approached completed the survey due to the proper entry protocols observed and the involvement of local residents as research assistants.

The key informant interviews, focus groups, and field observation started in November, 2011 but training of research assistants and the survey was conducted from January, 2012 to November, 2012. Questions from Appendix F, Q2 and Q17 of Appendix G were used for this chapter. The data-set collected was coded and analyzed using IBM SPSS version 21 and Office 2013 Microsoft Excel.

2.4 Results and Discussion

2.4.1 Tourist motivations for visiting Mole National Park

Possible motivations for visiting Mole (Q3 of Appendix G) using a Likert scale scores ranging from 1 “not at all important,” to 5 “extremely important” are shown in Table 2.

Table 2: Tourist motivations for visiting Mole in descending order of importance.

Motivations	Percentage of responses						Mean	Std. Dev.
	1	2	3	4	5	4+5		
Seeing wildlife	0.0	0.0	0.0	0.0	100.0	100.0	5.0	0.0
Being close to nature	0.0	0.0	0.0	0.0	100.0	100.0	5.0	0.0
Enjoying views	0.0	0.0	0.0	100.0	0.0	100.0	4.0	0.0
Learning about wildlife and nature	1.7	8.6	14.0	43.4	32.3	75.7	4.0	1.0
Having adventure	4.9	10.6	9.1	40.0	35.4	75.4	3.9	1.1
Experiencing and Learning about another culture	10.6	17.7	13.7	32.3	25.7	58.0	3.4	1.3
Away with family or friends	12.0	18.3	13.1	30.6	26.0	56.6	3.4	1.4
Getting away	12.6	16.0	15.1	39.7	16.6	56.3	3.3	1.3
Relaxing	14.9	18.3	12.3	30.3	24.3	54.6	3.3	1.4
Likert Scale of Motivations: 1= Not at all important, 2= Somewhat important, 3= Not sure, 4= Very important, 5= Extremely important. N=350								

Seeing wildlife, being close to nature, and enjoying views are the top motivations for tourist visitation. Wildlife viewing and being close to nature are important motivations for people to visit national parks and take part in NBT throughout the world (Hughes and Calsen, 2008; Kuenzi and McNeely, 2008). Charismatic mega fauna such as lions, elephants, rhinoceros, leopards and buffalos are very attractive to tourists (Duffield et al., 2008).

Enjoying views and learning about wildlife and nature have the same mean scores but different frequency distributions. Enjoying views is very important to all respondents, but does not achieve the highest ranking, of extremely important, for any respondents. In contrast, learning about wildlife and nature has a much higher standard deviation, with almost one third of respondents rating it in the highest category, but also with some respondents showing little interest. In other words, some respondents are highly interested in the learning aspect of their visit, others much less so. This difference in motivations amongst respondents is one of the key variables that distinguishes ecotourism-oriented visitors from other visitors (Needham et al., 2011). Learning more about nature is an important aspect of ecotourism and one of the challenges is to stimulate the learning aspect, even in respondents that may ostensibly show little interest. Over time, it would be hoped that the overall desire for learning increases amongst the park visitors (Orams, 1995). Experiencing and learning about another culture, being away with family or friends, getting away, and relaxing were of average importance in terms of motivations to visit Mole. Push factors usually precede pull factors in terms of initiating travel desire (Bello and Etzel, 1985) but in this study the push factors of “relaxing” and “getting away” are not primary motivation for visiting Mole.

An Independent-Samples T Test comparison of motivations for visiting Mole reveals only one significant difference between domestic and international tourists. “Getting away” ($t = 2.05$, $df = 87.78$, $p < 0.04$) was rated as a higher motivation for domestic tourists than international tourists. This finding may be due to Ghana’s growing middle class desire to escape city life to enjoy some quiet.

2.4.2 Perceived wildlife impacts on tourists and adjacent communities

Respondents were asked to rate how specific wild animals affected their experience in Mole (Q6 of Appendix F) on a Likert scale ranging from 1 “strongly detracted,” through to 5 to “strongly enhanced.” (Table 3). The species included in the list were generated from input by tourism-related park staff and discussions with two tourist focus groups and represent all the species most commonly encountered.

Table 3: The effect of wildlife species on tourist experience in Mole

Wildlife	Percentage of responses						Mean	Std. Dev.
	1	2	3	4	5	4+5		
Elephants	0.9	0.3	2.6	14.6	81.7	96.3	4.76	0.60
Antelopes	0.9	1.4	9.4	31.7	56.6	88.3	4.42	0.79
Monkeys	2.3	2.0	9.4	34.3	52.0	86.3	4.32	0.90
Warthogs	1.7	2.6	10.6	34.0	51.1	85.1	4.30	0.89
Baboons	3.4	3.1	14.0	35.4	44.0	79.4	4.13	1.00
Birds	3.7	4.3	24.6	33.4	34.0	67.4	3.89	1.04
Crocodiles	4.3	9.1	27.7	31.7	27.1	58.9	3.68	1.10
Insects	22.6	25.7	34.3	10.9	6.6	17.4	2.54	1.15
Snakes	24.6	15.4	44.6	8.0	7.4	15.4	2.58	1.16
Scorpions	27.7	15.1	43.4	10.6	3.1	13.7	2.46	1.10
Likert Scale of wildlife impact: 1= Strongly detracted, 2= Somewhat detracted, 3= Not sure, 4= Somewhat enhanced, 5=Strongly enhanced, N=350								

Wild animals that impact positively on tourists in Mole are elephants, antelopes, monkeys, warthogs and baboons whereas scorpions, snakes, and insects impact negatively on tourists. Elephants are the flagship species of Mole and the highlight of many visits is sighting elephants, supporting the assertion that “charismatic mega-fauna” such as elephants, lions, buffalos, leopards, and rhinoceros represents the feature of PAs most important to tourists (Lindsey et al., 2007). Monkeys and baboons are also very attractive to tourists. Baboons particularly impact positively on tourists due to their entertaining nature and social behaviour. However, there have been occasions when baboons and patas monkeys have attacked or stolen food from tourists. This problem could get worse with more tourism. But generally wildlife impacts positively on tourists and enhances their experience in Mole.

An Independent-Samples T Test comparison of the effect of different wildlife species on domestic and international tourist experience showed that four species were significantly different between domestic and international tourists. Warthog's impact on tourists are positive. Their high numbers make them easily seen by tourists and they are very common around the park headquarters where the Motel is located. Warthogs have peculiar habit of kneeling on the front knees while feeding. Their young ones raise their tail at right angle to their body while running. As a species endemic to Africa, non-African tourists find their behaviour fascinating, which may explain while international tourists rated their impact higher than domestic tourists ($t -2.56$, $df 65.29$, $p < 0.01$).

There were also significant differences between domestic and international tourists in the evaluation of scorpions ($t -2.78$, $df 72.22$, $p < 0.01$) snakes ($t -2.71$, $df 74.48$, $p < 0.01$) and insects ($t -2.36$, $df 72.28$, $p < 0.02$). Although these species impact on the experience of tourists, but the impact was greater in international tourists than domestic tourists. Domestic tourists are probably more familiar with tropical insects than international tourists. Most international tourists are careful about insect bites and are seen carrying insect repellent. Also international tourists from temperate climates may not be familiar with tropical scorpions and snakes and these species may hold some novelty value.

Respondents from adjacent communities were also asked to rate how specific wild animals affected their experience of living near the park (Q2 of Appendix G) on a Likert scale ranging from 1 "strongly detracted," to 5 "strongly enhanced." The list of species was generated by two key informants in each community and focus groups with community members and includes all species that the villagers felt were important. Given their greater familiarity with the species the list is more extensive than the tourist list. However, seven species were common to both the tourist and community list and are compared in Table 4.

Table 4: Comparison of wildlife species impact between tourists and adjacent communities

Wildlife	Adjacent communities		Tourists		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Elephants	1.74	1.09	4.76	0.60	-51.85	805.43	0.00
Warthogs	1.87	1.16	4.30	0.89	-34.57	842.13	0.00
Baboons	1.97	1.10	4.13	1.00	-29.73	794.21	0.00
Birds	2.22	1.09	3.89	1.04	-22.37	845.00	0.00
Insects	1.52	0.88	2.54	1.15	-13.86	615.47	0.00
Snakes	1.57	0.94	2.58	1.16	-13.42	637.01	0.00
Scorpions	1.56	0.82	2.46	1.10	-12.86	599.73	0.00

Likert Scale of wildlife impact: 1= Strongly detracted, 2= Somewhat detracted, 3= Not sure, 4= Somewhat enhanced, 5=Strongly enhanced
Adjacent communities N=500, Tourists N=350

An Independent-Samples T Test comparison of the species common to the tourist and adjacent community list (Table 4) shows that all seven species were rated significantly differently by adjacent communities and tourists. The mean scores of tourists for all the seven species were significantly higher than that of adjacent communities. Wildlife species such as elephants, warthogs, baboons, and birds create a positive impact on tourists, whereas the same species are seen as detracting from the experience of living near the park by the adjacent communities. The species detract from the experience of adjacent communities because these species either destroy their crops or attack their livestock. For example, elephants, the flagship species of Mole, are also among the species that raid crops and are a major problem for communities in the southern parts of the park (MNP, 2011). Warthogs are also noted for uprooting tubers and destroying other farm crops. Baboons are omnivorous, and destroy crops as well as attack livestock particularly fowls. Birds such as partridges, parrots, and hornbills are a nuisance to farmers and destroy crops. Partridges eat planted seeds and seedlings and sometimes dig holes around tubers exposing them to the scorching sun. Parrots destroy mostly maize and sometimes guinea corn and millet whereas hornbills destroy mostly millet and

sometimes guinea corn. This finding agrees with Lepp, (2007) who found that agriculturalists are vulnerable to the same wildlife that attracts tourists.

Insects such as sandflies are a nuisance to some of the adjacent communities. Tsetse flies are also present in some areas. Although, they are associated with large ungulates such as buffalos and antelopes they also bite humans. There are other tropical insects such as mosquitos, houseflies, and agricultural insect pests that disturb their crops. The dislike of snakes and scorpions by the adjacent communities is because of their bites and stings. Most of the snakes found in these areas are poisonous and farmers have to contend with these creatures in their farming activities.

2.4.3 Tourist experiences in Mole National Park

Respondents were asked to score their satisfaction with various experiences at Mole (Q5 of Appendix F) using a Likert scale ranging from 1 “very unsatisfied,” to 5 to “very satisfied” The responses (Table 5) are rank ordered by column 8 (the mean scores). This list was generated from the literature and following input from key informants and focus groups.

The results show that tourists are satisfied with most of the items. Elephants, the flagship species of Mole, have a 100% satisfaction rating. Fundamental attractions of the park such as wildlife and natural environment are also rated very high by tourists (Table 5). High-quality visitor experiences are more likely to develop public appreciation of, and support for, conservation of national park resources (Manning, 2001). The high tourist rating of wildlife particularly elephants and the natural environment could therefore engender support for the park and conservation.

However, certain managerial deficiencies such as travel to the park, food services in the park, and accommodation were rated low by tourists (Table 5). Although, “travel to the park” may be beyond the scope of park management, the laterite road from Fulfulo to Sawla is often in poor condition and makes travel very uncomfortable. Portions of the road are so bumpy that it’s very uncomfortable to travel, especially in a sedan (saloon) car. Bus service to the park also takes a long time: the bus arrives at the park late in the night, and leaves at dawn. This makes travel to and from the park quite challenging

Table 5: Tourist satisfaction of experiences in Mole

Experience	Percentage of responses						Mean	Std. Dev.
	1	2	3	4	5	4+5		
Seeing elephants	0.0	0.0	0.0	0.0	100.0	100.0	5.00	0.00
Seeing natural environment	0.3	3.4	5.4	36.3	54.6	90.9	4.41	0.77
Safety in the park environment	0.9	4.0	6.3	42.0	46.9	88.9	4.31	0.82
Seeing other wildlife	0.3	6.6	8.0	44.3	40.9	85.1	4.23	0.82
Friendliness of park staff	1.4	8.3	6.6	36.6	47.1	83.7	4.20	0.98
Weather	0.6	6.9	8.0	42.6	42.0	84.6	4.19	0.89
Behaviour of wildlife	1.7	3.7	13.4	36.6	44.6	81.2	4.18	0.92
Guided tour	2.3	5.7	9.7	37.1	45.1	82.3	4.17	0.98
Viewing platforms	1.7	4.0	17.4	38.0	38.9	76.9	4.08	0.93
Quality of trails	1.4	4.6	17.4	42.6	34.0	76.6	4.03	0.91
Numbers of other tourists	1.1	8.0	16.9	48.0	26.0	74.0	3.90	0.92
Seeing birds	1.4	11.7	13.4	43.4	30.0	73.4	3.89	1.01
Behaviour of other tourists	2.6	10.0	17.4	43.7	26.3	70.0	3.81	1.02
Park entrance fee	6.0	14.6	16.3	34.6	28.6	63.1	3.65	1.21
Visitor/ information center	1.7	15.1	22.0	40.9	20.3	61.1	3.62	1.02
Signage in park	2.0	8.0	39.1	30.3	20.6	50.9	3.59	0.97
Friendliness of motel staff	7.4	19.7	12.6	32.9	27.4	60.3	3.54	1.28
Accommodation	8.9	16.3	12.6	42.0	20.3	62.3	3.48	1.23
Food services in the park	13.7	22.0	20.0	33.1	11.1	44.3	3.06	1.24
Travel to the park	25.4	22.9	15.7	24.0	12.0	36.0	2.74	1.38
Likert scale of satisfaction 1=Very unsatisfied, 2=Somewhat unsatisfied, 3=Not sure, 4=Somewhat satisfied, 5=Very Satisfied, N=350								

The main source of food for tourists in Mole is the Motel restaurant, with a few tourists trying food from the workers' canteen. Sometimes it takes a long time for a food order to be ready, and at other times specific menu items are not available. The situation is compounded due to the remote nature of MNP which has few alternatives for dissatisfied tourists.

Accommodation and the attitude of the Motel staff were also rated low by tourists. As the only source of accommodation in the park for tourists, the Motel staff

should be trained to provide quality service to clients. Tourists persistently complaint about the attitude of the Motel staff and if there were other options available in the park, some tourists may not choose the Motel. In addition, the Motel needs a major rehabilitation and expansion. During the peak season, tourists are frequently turned away because of a lack of rooms. During the study, a group occupied the motel for one month for a conference. During that month, tourist numbers went down because there was no place to accommodate them. Unfortunately nearby communities do not have enough facilities to accommodate excess tourists who visit the park. Private partnerships could be employed to provide extra accommodation, preferably eco-lodges, in the park and in nearby communities for the growing tourist numbers.

Tourists were also not too satisfied with signage in the park and the visitor/information centre. Although, there are sign posts to show where the major facilities such as the Motel, visitor centre, offices, and loops for drive safari are located, there is still much to be done. Signage could be provided at vantage points along the trails to tell stories about specific species, habitats, and threats as well as give message about conservation. Certain points of wildlife interaction such as salt licks, elephants bathing pools, unique habitats for certain wildlife species, plants which particular species feed on could be labelled and be points of discussion during guided tours.

Park information centres are intended to provide important and interesting information for park visitors (Hvenegaard et al., 2009). The visitor information center is supposed to be the primary source of information about the park, and should have brochures, maps, and safety information, among other items to inform tourists. However, in Mole, the visitor information center is small, underdeveloped, and poorly located. It is also underutilized. The conference room adjacent to the visitor center could be used for video shows to tell stories about what one should expect in the park, the history of the park, the culture of the adjacent communities, and education about wildlife in the park.

An Independent-Samples T Test comparison of experiences at Mole (Table 6) showed that five out of 20 experiences were significantly different between domestic tourists and international tourists. International tourists' rating of accommodation, quality of trails, and weather were higher than domestic tourists (Table 6).

Table 6: Comparison of domestic and international tourist experiences in Mole

Experience	Domestic tourists		International tourists		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Seeing elephants	5.00	0.00*	5.00	0.00*			
Seeing birds	3.66	1.18	3.66	1.18	-1.70	73.12	0.09
Seeing other wildlife	4.43	0.80	4.20	0.82	2.02	348.00	0.04
Behaviour of wildlife	4.19	0.93	4.18	0.92	0.09	347.00	0.93
Seeing natural environment	4.38	0.86	4.42	0.75	-0.41	346.00	0.68
Accommodation	2.96	1.38	3.58	1.18	-3.52	347.00	0.00
Food services in the park	2.91	1.34	3.09	1.22	-1.00	347.00	0.32
Travel to the park	2.43	1.58	2.43	1.58	-1.69	73.93	0.10
Guided tour	4.21	0.79	4.16	1.01	0.36	98.25	0.72
Quality of trails	3.48	0.95	4.13	0.87	-5.07	345.00	0.00
Signage in park	3.50	1.01	3.61	0.96	-0.75	346.00	0.45
Viewing platforms	4.00	1.02	4.00	1.02	-0.71	347.00	0.48
Visitor/ information center	3.98	0.94	3.55	1.03	3.06	81.95	0.00
Weather	3.77	1.11	4.27	0.82	-3.23	66.97	0.00
Numbers of other tourists	3.80	1.11	3.92	0.88	-0.74	67.32	0.46
Behaviour of other tourists	3.77	1.01	3.81	1.02	-0.31	78.38	0.76
Safety in the park environment	4.32	0.89	4.30	0.80	0.09	347.00	0.93
Friendliness of park staff	4.14	1.13	4.21	0.95	-0.43	72.51	0.67
Friendliness of motel staff	3.74	1.36	3.50	1.26	1.30	347.00	0.20
Park entrance fee	3.59	1.21	3.66	1.21	-0.45	348.00	0.65
<p>*t cannot be computed because the standard deviations of both groups are 0. Likert scale of satisfaction 1=Very unsatisfied, 2=Somewhat unsatisfied, 3=Not sure, 4=Somewhat satisfied, 5=Very Satisfied Domestic tourists N=59, International tourists N=291</p>							

The higher mean value of accommodation for international tourists than domestic tourists is probably because more international tourists stay in the Motel than domestic tourists. Domestic tourists such as students on excursions only make a return trip to Mole as well as those from the catchment area. The higher mean value of weather for international tourists than domestic tourists could be due to most of the international tourists coming from temperate environments and see the weather as an opportunity to enjoy summer and therefore were more satisfied with the weather than domestic tourists who are too familiar with the weather. International tourists also appear to be satisfied with the quality of trails in Mole. However, international tourists were very unsatisfied with the visitor/information center. The information center in Mole is not well equipped and does not offer much to tourists and need to be improved.

Domestic tourists rated “seeing other wildlife” apart from those provided in the survey list and the information/visitor center higher than international tourists (Table 6). The higher mean value of “seeing other wildlife” apart from those provided in the survey list for domestic tourists than international tourists could be due to the cultural and traditional value that domestic tourists place on all kinds of wildlife whereas some international tourists may be only interested in specific species such as birds, elephants and monkeys.

2.4.4 Guided tour and tourist experience

Respondents were asked to score their satisfaction with guided tours in Mole (Q8 of Appendix F) using a Likert scale ranging from 1 “very unsatisfied,” to 5 “very satisfied” Table 7. The results showed that tourists were satisfied with most aspects of the guided tour. Wildlife scored very highly as well as most attributes of the walk itself. However, discussion of Ghana’s cultural heritage was rated low by tourists.

The tourist experience is highly influenced by the nature of guided tours (Mak *et al.*, 2010). Unlike national parks in many Western countries where tourists can explore on their own without a guide, MNP, like most African countries, allows only guided tours. This regulation is intended to provide safety for park visitors from dangerous wildlife, and also to provide interpretation about the park. Mole offers two main types of guided tours: foot safari and drive safari. The drive safari is more expensive than the foot safari,

yet, there are times that those on foot safari see all the same wildlife as those on the drive safari, creating some dissatisfaction amongst the latter. Currently a foot safari fee for international tourists is GHC5 per hour (about \$2.5), while the fee for Ghanaian tourists is GHC3 per hour (about \$1.5). A drive safari is GHC60 per hour (about \$30) for both Ghanaian and non-Ghanaian tourists.

Table 7: Tourist satisfaction with guided tours in Mole

Experience	Percentage of responses						Mean	Std. Dev.
	1	2	3	4	5	4+5		
Safety of the walk	0.3	2.3	2.3	33.5	61.6	95.1	4.54	0.68
Wildlife seen on the walk	0.6	1.7	1.4	36.3	60.0	96.3	4.53	0.67
Length of walk	1.4	4.3	1.7	35.8	56.7	92.6	4.42	0.84
Guide's knowledge of wildlife	2.0	6.4	3.2	25.1	63.3	88.4	4.41	0.97
Physical difficulty of the walk	1.1	3.4	5.7	35.2	54.4	89.7	4.38	0.83
Number of people in your group	0.9	6.9	3.8	32.7	55.8	88.4	4.36	0.91
Overall organization of walk	1.1	3.7	6.3	41.1	47.7	88.9	4.31	0.84
Guide did not allow people to feed wildlife	2.3	2.3	11.0	36.3	48.1	84.4	4.26	0.91
Guide's knowledge of other park features	3.7	4.9	12.9	29.3	49.1	78.4	4.15	1.06
Guide's control of the group behaviour	3.2	5.7	7.4	43.3	40.4	83.7	4.12	0.99
Guide's ability to create interest in the park	4.0	7.7	8.3	38.7	41.3	79.9	4.05	1.08
Other things seen on the walk	1.1	11.2	10.6	41.4	35.6	77.0	3.99	1.01
Guide's minimizing visitor impact in the park	3.2	6.6	16.3	36.7	37.2	73.9	3.98	1.04
Guide discussed reasons for not feeding wildlife	6.9	8.9	23.8	19.8	40.7	60.5	3.79	1.26
Guide's discussion of local Ghanaian culture	12.4	17.0	26.2	27.4	17.0	44.4	3.20	1.26
Likert scale of satisfaction 1=Very unsatisfied, 2=Somewhat unsatisfied, 3=Not sure, 4=Somewhat satisfied, 5=Very Satisfied, N=350								

The high rating of safety of the walk underscore the guide professional competence in providing safety for tourist. The guides carry guns and ensures the safety of tourists from possible attacks by wildlife. Also the high rating of wildlife seen on the walk underscores the importance of wildlife as a motivation for visiting the park. Most of

the attributes of the walk such as length of the walk, guides knowledge of wildlife, the physical difficulty of the walk, and number of people in a group were rated high, indicating that visitors were satisfied with the guided tour. The lower rating of discussion of local Ghanaian cultural heritage is a source of concern. Mole has an interesting history as well as historical and archeological sites such as an old slave trade route, caves and shrines. The surrounding communities also have an interesting cultural heritage. Tour guides should be trained to discuss this rich culture with tourists visiting the park. This may even increase tourists' interest in visiting some of the nearby communities which can boost tourism in these communities.

In Mole, there are no private tour guides. They are all park staff and are trained to be knowledgeable and ensure safety of tourists (carry guns). However, some of them are not well trained in interpretation techniques (communication). Interpretation by guides is not consistent, and when interpretation is provided it tends to focus narrowly on the identification of wildlife or plants, with little attention given to broader issues like the role of PAs in maintaining biodiversity, or the need for biodiversity. In addition, during the peak season, some of the park's law enforcement staff are called to assist in tour guiding. Unfortunately, some of these staff only take the tourists round as if they are going on law enforcement patrol with very little interpretation. On these occasions tourists may return from their guided tour very dissatisfied. The present situation calls for re-training of tour guides and law enforcement staff who assist in tour guiding during peak season to seek higher tourist satisfaction.

The guide's ability to communicate crucial and interesting information will likely influence visitor experience. Improved interpretation leads to visitor satisfaction and increased attachment to the national park and provide more opportunities for tourists involvement in park related issues (Hwang et al., 2005). Tour guides should have expertise in natural history, botany, conservation, or other fields of interest to tourists (Brockelman and Dearden, 1990), but also must be skilled in the techniques required for effective communication to tourists. All too often, highly knowledgeable park interpreters provide poor interpretation experiences because they lack training in how to communicate to diverse groups of tourists (Hvenegaard et al., 2009).

The way payment is made for guided tours may also affect the tourist experience. In Mole, usually tourists complete the guided tour before making payment based on the number of hours spent. Sometimes tourists are reluctant to pay for the hours spent because they feel dissatisfied with the tour. Guided tour services could be graded (2hours, 3hours, 4hours etc.) and tourists could choose and pay before embarking on the tour to avoid any confusion over payment.

An Independent-Samples T Test comparison of experiences with guided tour in Mole (Table 8) revealed that four out of 15 experiences were significantly different between domestic tourists and international tourists.

Table 8: Comparison of domestic and international experiences with guided tours in Mole

Experience	Domestic Tourists		International Tourists		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Wildlife seen on the walk	4.64	0.667	4.51	0.67	1.29	348	0.20
Safety of the walk	4.35	0.744	4.58	0.67	-2.28	347	0.02
Length of walk	4.21	0.818	4.46	0.84	-2.07	347	0.04
Physical difficulty of the walk	4.14	0.833	4.43	0.83	-2.43	347	0.02
Overall organization of walk	4.47	0.777	4.27	0.85	1.60	348	0.11
Guide's knowledge of wildlife	4.52	0.786	4.39	1.00	0.88	344	0.38
Number of people in your group	4.33	.840	4.36	0.92	-0.25	344	0.80
Guide did not allow people to feed wildlife	3.96	1.017	4.31	0.88	-2.67	345	0.01
Guide's control of the group behaviour	4.12	0.975	4.12	0.99	0.00	347	1.00
Guide's ability to create interest in the park	4.24	0.865	4.02	1.12	1.45	347	0.15
Guide's knowledge of other park features	4.33	0.893	4.12	1.09	1.41	346	0.16
Other things seen on the walk	4.00	0.964	3.99	1.02	0.07	346	0.94
Guide's minimizing visitor impact in the park	3.81	1.146	4.02	1.02	-1.38	347	0.17
Guide discussed reasons for not feeding wildlife	3.60	1.169	3.82	1.27	-1.21	347	0.23
Guide's discussion of local Ghanaian culture	3.26	1.142	3.18	1.28	0.44	345	0.66
Domestic tourists N=59, International tourists N=291							

All the four experiences: safety of the walk, length of walk, physical difficulty of the walk, and guide not allowing people to feed wildlife were rated higher by international tourists than domestic tourists. This perhaps could be due to international tourists being interested in both wildlife viewing and the physical attributes of the guided tour whereas domestic tourists are only interested in wildlife viewing.

2.4.5 Tourist response to experiences in Mole National Park

Respondents were asked to score the response of their experiences in Mole (Q11 of Appendix F) on a Likert scale ranging from 1 “strongly disagree,” to 5 to “strongly agree.” The responses (Table 9) are rank ordered by means.

Table 9: Tourist response to experiences in Mole

Response to experience	Percentage of responses						Mean	Std. Dev.
	1	2	3	4	5	4+5		
Appreciation of wildlife	2.6	2.6	8.7	36.5	49.6	86.1	4.28	0.92
Found the park attractive	4.9	4.1	8.7	36.3	45.9	82.3	4.14	1.07
Increased support for conservation	2.6	3.8	14.8	33.6	45.2	78.8	4.15	0.98
Word of mouth promotion	4.0	4.6	15.3	39.0	37.0	76.0	4.00	1.04
Would visit again	5.8	9.3	18.6	33.9	32.5	66.4	3.78	1.17
Inspired to invest in park related tourism	17.2	20.6	31.4	17.4	13.4	30.8	2.89	1.26
Willing to pay more entrance fee	29.5	21.4	18.8	15.3	15.0	30.3	2.65	1.43
Feeling of fear about wildlife	45.1	20.5	15.6	11.8	6.9	18.8	2.15	1.30
Likert scale 1=Strongly disagree, 2=Somewhat disagree, 3=Not sure, 4=Somewhat agree, 5= Strongly agree, N=350								

Appreciation of wildlife, attractiveness of the park, increased support for conservation, and word of mouth promotion of the park were rated very high by tourists whereas feeling of fear about wildlife was rated very low (Table 9). The high rating of appreciation of wildlife and the low rating of feeling of fear about wildlife is good for conservation. Appreciation of wildlife devoid of fears will engender support for conservation. In addition, the high rating of word of mouth promotion of the park and repeat visitation shows that tourists overall are satisfied with their experience in Mole.

Understanding tourist satisfaction is important for the long-term success of any tourism attraction (Alegre and Garau, 2010).

However, interest to invest in tourism and willingness to pay more entrance fee were rated low by tourists. This is a source of concern because private partnership is a way forward to inject the needed capital in tourism development in parks. The park management could target affluent Ghanaians for partnership in tourism development. With the construction of the Ffulso to Sawla laterite road underway, it could ease travel to the park challenges and boost tourism. Such partnership will go a long way to ensure tourism development in the park and in nearby communities.

Willingness to pay more entrance fees is a thorny issue all over the world. The literature suggests that some non-visitors to national parks feel user fees are a barrier to visitation (Ostergren et al., 2005) and other research has shown that raising prices increasingly affects low and middle-income users (More and Stevens, 2000; More et al., 2008). Park management should find innovative ways of selling products and services to tourists to raise more money for conservation such as locating a gift shop in a strategic location for tourists to buy products. The gift shop in Mole is in an obscure location. The visitor center could be re-arranged such that visitors are taken on a tour in the museum, given education about wildlife and cultural heritage of the surrounding communities and the tour ending in the gift shop. This will present a good opportunity for tourists to buy products from the shop. Tourist response to experiences in Mole is discussed next.

An Independent-Samples T Test comparison of tourist response to experiences (Table 10) reveals that three out of eight responses were significantly different between domestic tourists and international tourists. Two of the responses: “would visit again” and “feeling of fear” were rated higher by domestic tourists than international tourists. The high rating of “would visit again” by domestic tourists shows that there is market for domestic tourism. Park management could target the growing middle class in Ghana for the tourism drive. This class may represent the affluent domestic residents and reaching out to them could engender support for private partnership in tourism development as well as raise support for conservation. High rating of “feeling of fear” by domestic tourists is not worrying because only about 18% (Table 9) of the total tourists’

respondents expressed feeling of fear about wildlife. Nevertheless, efforts should be made to ensure continuous wildlife education to diffuse the feeling of fear about wildlife.

Table 10: Comparison of domestic and international response to experiences in Mole

Response to experience	Domestic Tourists		International Tourists		t	df	Sig. (2-tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Appreciation of wildlife	4.49	0.74	4.24	0.95	1.88	343.00	0.06
Found the park attractive	4.24	1.09	4.12	1.06	0.70	74.94	0.49
Increased support for conservation	4.36	0.85	4.11	1.00	1.76	343.00	0.08
Word of mouth promotion	3.96	0.97	4.01	1.05	-0.30	344.00	0.76
Would visit again	4.11	1.27	3.72	1.14	2.13	71.27	0.04
Inspired to invest in park related tourism	3.05	1.37	2.86	1.24	1.04	342.00	0.30
Willing to pay more entrance fee	2.13	1.16	2.75	1.45	-3.54	91.58	0.00
Feeling of fear about wildlife	2.66	1.39	2.05	1.26	3.26	344.00	0.00
Likert scale 1=Strongly disagree, 2=Somewhat disagree, 3=Not sure, 4=Somewhat agree, 5= Strongly agree, Domestic tourist N=59, International tourists N=291							

Out of the 30% total respondents who expressed “willingness to pay a higher entrance fee,” international tourists were significantly more amenable than domestic tourists. However, this cannot be used as a justification to increase the entrance fee since 70% of the total tourists’ respondents were not ready to pay more entrance fee. Nonetheless, National Parks with comparable attractions to Mole in other developing countries often charge higher entrance fees than Mole. Currently, the entrance fee in Mole for adult international tourists is GHC20 (about \$10) and for children GHC10 (about \$5). The fees for a Ghanaian adult is GHC10 (about \$5), for Ghanaian Tertiary students GHC5 (about \$2.5), and for Ghanaian High school students GHC2 (about \$1).

2.4.6 Number of times visited Mole National Park

Respondents were asked about the number of times they had visited the park (Q1 of Appendix F (Table 11)).

Table 11: Number of times visited Moe National Park

Number of times visited Mole	Percentage of responses		
	Domestic Tourists	International Tourists	Total Tourists
Not at all	24.1	77.3	68.5
Once	39.7	14.4	18.6
2 to 3 times	12.1	4.8	6.0
4 to 5 times	5.2	1.7	2.3
More than 5 times	19.0	1.7	4.6
Chi-Square = 74.62, df = 4, Sig. = 0.00, Domestic tourists N= 59, International tourists N= 291, Total tourists N= 349			

Almost 70% of the respondents were first time visitors, with about 20% on a second visit. Over 77% of the international tourists were first time visitors. A Pearson Chi-Square test showed a significant difference between domestic and international tourists. Domestic tourists tend to visit Mole more often. The over 22% international tourists with repeated visits to Mole are foreign expatriates living in Ghana such as volunteers, people working with NGOs and other organizations.

Most of the tourists are first time visitors and as such their experiences will influence subsequent visits or promotion of the park. According to the behavioural model (Needham and Rollins, 2008), if tourists expectations are met, they are likely to come for a repeated visit, seek similar experiences elsewhere or make recommendations to friends and family. Return visitation and positive reports to others requires good levels of visitor satisfaction with park environments, facilities and programs (Eagles, 2013). About one third of the tourists are on repeat visits indicating that tourist expectations are largely met in Mole. However, there is still much to be done in Mole in terms of facilities such as expansion and improvement of accommodation.

2.4.7 Age groups of tourists visiting Mole National Park

Respondents were asked about their age groups (Q16 of Appendix F, Table 12).

Table 12: Age groups of tourists visiting Mole National Park

Age of Respondents	Percentage of responses		
	Domestic Tourists	International Tourists	Total Tourists
Under 18years	14.5	2.4	4.4
18 - 25years	36.4	49.3	47.2
26 - 35years	25.5	25.3	25.4
36 - 45years	18.2	11.1	12.2
46 - 55years	3.6	4.5	4.4
56 - 65years	1.8	6.3	5.5
Over 65years	0.0	1.0	0.9
Chi-Square = 21.31, df = 6, Sig. = 0.00, Domestic tourists N= 55, International tourists N= 288, Total tourists N= 343			

The age cohort of 18-25years recorded the highest number of tourists whereas over 65years had the least tourists. About 77% of the tourists were under 35years. A Pearson Chi-Square test showed a significant difference between domestic and international tourists. International tourists of 18-25years were the highest number of visitors to Mole..

The domestic tourists within the age cohort 35 years and below who visit the park are mainly students from first, second, and tertiary institutions who visit on excursions. Park management could target this age group for conservation education by assisting to form wildlife and conservation clubs in schools and also visiting schools on conservation outreach programs. About 22% of the domestic tourists who visit Mole were within the age cohort 36-55 years. This age group probably represents the growing middle class in Ghana. Park management could also target this group for a market drive in tourism.

2.4.8 Sources of information about Mole National Park

Respondents were asked about how they heard about Mole (Q2 of Appendix F, Table 13)

Table 13: Sources of information about Mole National Park

Source of information about Mole	Percentage of responses			Chi-Square	df	Sig.
	Domestic Tourists	International Tourists	Total Tourists			
Travel books	20.7	46.2	42.0	12.92	1.0	0.00
Internet	5.2	12.8	11.5	2.73	1.0	0.10
TV	20.7	1.7	4.9	37.42	1.0	0.00
Travel agents	6.9	10.3	9.8	0.65	1.0	0.42
Friends	62.1	38.3	42.2	11.22	1.0	0.00
Family members	19.0	7.2	9.2	7.96	1.0	0.00
Others	3.4	10.0	8.9	2.56	1.0	0.11
Domestic tourists N= 59, International tourists N= 290, Total tourists N= 348						

About 42% heard about the park through travel books and another 42% through friends. A Pearson Chi-Square test showed that the number of people that heard about Mole through travel books, TV, friends, and family members were significantly different between domestic and international tourists. More international tourists heard about Mole through travel books than domestic tourists whereas more domestic tourists heard about Mole through friends, family members and TV than domestic tourists. Sources of information about destinations influence travel motivations. Recommendations from friends and family may be based on the satisfaction of their experience. So over 50% of tourists hearing about the park through friends and family members is very encouraging.

However, only a small percentage hearing about the park through travel agents, internet and TV is a source of worry. Television programs and the internet are important sources of information used by people to learn about target destinations and have a strong impact over time (Sparks and Pan, 2009). This is an area that park management need to focus on as they seek to upscale NBT in Mole. With the growing middle class in Ghana (GSS, 2010), such a drive in marketing could attract more domestic tourists.

2.4.9 Adjacent communities' ideas for tourism activity expansion.

Adjacent communities were asked to rate their perception of tourism activity expansion (Q17 of Appendix G) using a Likert scale with a score of 1 corresponding to

“very bad,” through to 5 to “very good.” The responses (Table 14) are rank ordered by the mean scores.

Table 14: The perceptions communities adjacent to Mole National Park about tourism activity

Perception of tourism	Percentage of responses						Mean	Std. Dev.
	1	2	3	4	5	4+5		
Community tours for tourists	0.8	3.2	3.8	41.6	50.6	92.20	4.38	0.78
Showcasing attractive features of the community	1.6	3.0	5.0	33.2	57.2	90.40	4.41	0.85
Farm tours for tourists	1.4	3.2	5.4	34.0	56.0	90.00	4.40	0.84
Homestay for tourists	0.8	4.6	4.8	36.0	53.8	89.80	4.37	0.84
Cultural performances to tourists	1.2	3.8	5.6	40.2	49.2	89.40	4.32	0.84
Marketing community as tourism destination	2.0	5.8	5.4	38.6	48.2	86.80	4.25	0.94
Likert scale: 1=very bad, 2=somewhat bad, 3=not sure, 4=somewhat good, 5=very good								

Generally, the respondents showed high responses for all variables (Table 14). Communities adjacent to Mole want to be marketed as a tourism destination and have various products to offer such as community tours, showcasing attractive features of the communities, farm tours, homestay, and cultural performances.

NBT is not only about PAs but also about PA-adjacent communities. Nearby communities should therefore be assisted to tap into the growing tourism industry in Mole. The majority of respondents want their communities to be marketed as a tourism destination and have various products and services to offer. Although most of these communities do not have electricity or pipe-borne-water, tourists who want to experience rural life would find such places interesting to stay. In addition, communities can be involved in providing food, transportation, and art and craft experiences for tourists. However, these products and services need to be packaged to make them attractive to tourists.

Local communities also need to form partnerships and collaborate with the park in order for tourists to be directed to the communities. Already Mognori is reaping benefits

from an “eco-village project”. Mognori’s eco-village offers products such as canoe safaris, community tours, cultural performances, and homestays. Also tour guides from the park bring tourists to bird watching excursions in Mognori. Tourists visiting the park are purposely offered the option of visiting the eco-village. There is even a motor cycle cart that takes tourists to Mognori from the park. Through this collaboration, some tourists find their way to Mognori, particularly those who want to experience the cultural heritage of the nearby communities. This can be duplicated in other nearby communities with similar attractions or different tourism niches carved for other communities. The private sector could play an important role in this regard. In this way, adjacent communities would benefit more from the growing tourism industry. NTB, when properly managed, can provide significant income to targeted villages near the borders of national parks and help reduce illegal exploitation by local inhabitants (Brockelman and Dearden, 1990).

2.4 Conclusions and Recommendations

Protected areas are an important conservation strategy, but support for PAs within the context of a developing country depends in part on a well-designed nature tourism strategy that generates the following outcomes:

- High level of tourism satisfaction.

In this study, visitor satisfaction was examined through the lens of the behavioural approach, one that focusses on an understanding of motivations and visitor perceptions of social, environmental, and managerial conditions. Visitors were satisfied with environmental features, such as seeing wildlife, but were less satisfied with a number of managerial features (such as travel to the park, food services and accommodation), and some social features (such as the behaviour of other tourists). Further, the behavioural approach suggests that tourist experiences will vary in each of these dimensions, as illustrated by comparisons between the responses of international and domestic tourists.

- Minimal impact on park resources.

The regulation regarding the use of guided tours is a positive step toward controlling visitor behaviours in ways that minimize impacts on wildlife and other park resources.

However, tour guides should provide reasons for certain regulations such “no feeding of wildlife in the park.

- Support for conservation.

Positive park experiences create the opportunity to increase support for conservation, but this usually requires effective interpretation. Interpretation by guides was not consistent, and when interpretation was provided it tended to focus narrowly on the identification of wildlife with little attention given to broader issues like the role of protected areas in maintaining biodiversity. Interestingly, a majority of the respondents found the park attractive, ready to do word of mouth promotion of the park, plan a repeat visit, and their experience has led to increased support for conservation.

- Conservation awareness and promotion of local cultures

Effective interpretation that creates awareness of conservation and local cultures was lacking. Interpretation can provide the critical link between visitor satisfaction and visitor support for conservation. Also promotion of local cultural heritage link nearby communities to tourism and helps conservation. This was not consistently evident in the performance of tour guides, nor was the visitor centre effectively developed for that purpose.

- Economic benefits to local communities.

Economic benefits can offset some of the livelihood challenges created by PAs, such as damage to crops or livestock by park wildlife. Communities adjacent to Mole perceive wildlife impact negatively due to the losses they suffer mainly from crop and livestock depredation. Elephants, the flagship species of MNP, are also involved in crop depredation in nearby communities. Offsetting these impacts, the community of Mognori has developed a significant tourism industry based on guided nature experiences and cultural experiences, but other communities lag behind. The successes at Mognori are likely due to its close proximity to the park headquarters, and the support of an NGO. Ghana lacks many of the financial resources required to implement a nature tourism program in communities near to national parks, and so must rely on partnerships with NGO's or the private sector.

- Linking tourism in Mole with heritage tourism

There is a value in connecting tourism in Mole to other tourism initiatives, for example that related to slave route tourism. There is a slave trading route that ran across Mole from Ducie to Bawena as well as several caves in the park. Some of these caves were used by slave raiders. The notorious slave raiders, Samori from Guinea and Babatu from Côte d'Ivoire, were based at the current site of the Mole school in the park headquarters and "Samole" loop trail is derived from "Samori" (MNP, 2011). However, the slave trading route and the caves are not accessible to tourists. When the slave route tourism is developed it could help attract the Diaspora community to boost tourism in Mole and the surrounding communities.

In summary, this study provides an insight into the challenges faced by a national park engaged in tourism at an early stage in the "product life cycle" (Butler, 1980; Duffus and Dearden, 1990). For tourism development to be sustainable and contribute to the outcomes identified above, appropriate planning and resourcing of tourism development is required. This study provides some direction specific for tourism planning and development in Mole, but has implications for nature tourism development in other countries as well.

Chapter 3: Concerns and Benefits of Park-Adjacent Communities in Northern Ghana

3.0 Abstract

Protected areas are increasingly becoming islands of habitat surrounded by seas of cultivation and development. Mole National Park, located in northern Ghana, is surrounded by 33 communities composed of subsistence farmers who rear livestock, hunt, and gather wild fruits and other non-timber forest products (NTFPs). Living near the park could be a blessing or a misfortune. This paper assesses the concerns and benefits of living near Mole. The study was conducted in 10 adjacent communities using key informants, focus groups and household surveys.

Overall, most people have a positive attitude towards the park. Yet, more than half of the respondents think that the cost of living near the park outweighs the benefits. Crop depredation, loss of farmlands, and lack of access to NTFPs are the top three concerns. Increased conservation awareness, provision of ecosystem services and maintenance of cultural identity are the top three benefits. The strongest predictor of a community's attitude towards the park is whether it is involved in a community resource management area (CREMA). Distance from the park, tourism involvement, traditional area, gender, and age of individuals are the next ranked factors. CREMA communities although had concerns had benefited more from integrated conservation and development projects due to their collaboration with the park. Communities closer to the park had concerns but rated benefits higher than communities farther away from the park. Communities involved in tourism were appreciative of their location and rated benefits higher than non-tourism communities.

Park management should intensify interventions to minimise crop depredation and other concerns, especially in communities within the zone of influence. Perception of concerns and benefits is important in the conservation process, and efforts should be made to ensure that concerns do not outweigh the benefits of living near PAs to ensure support for conservation.

Keywords: Concerns, benefits, Mole National Park, Adjacent Communities, Wildlife

3.1 Introduction

Living near protected areas (PAs) such as national parks is a mixed blessing for adjacent communities. PAs are increasingly becoming islands of habitat surrounded by seas of cultivation and development, with wildlife and humans competing for space and resources. As human activities intensify in and around PAs such as national parks, wildlife threatens associated economic security, livelihoods and even lives of people, and human-wildlife conflict escalates. This study assesses the concerns and benefits of living near Mole National Park (MNP), Ghana.

Species that are valued especially those considered endangered or being protected, are sometimes the very species that threaten people living around PAs. Activities such as poaching, encroachment, and practices that destroy the environment can stifle conservation initiatives. However, living near national parks and the associated wildlife can also have positive impacts for local communities. The benefits include: tourism, provision of food, hunting of bush meat with permission, cultural and religious-spiritual value, and the provision of ecosystem services.

Tourism in PAs offers significant opportunities to local communities in the developing world for reducing poverty (Brockelman and Dearden, 1990; Wells, 1992; Chok et al., 2007) while integrating conservation and development. Tourists visiting national parks also tend to interact with the adjacent communities. This may lead to some money staying in the local economy when local communities provide services like transportation, accommodation, food, or arts and crafts. Cultural performances such as drumming and dancing can also entertain tourists.

Apart from tourism, the provision of food and the permissible hunting of bush-meat are some of the benefits that communities adjacent to parks enjoy. Local communities around tropical PAs are mainly subsistence farmers who depend on the land for their livelihood. Bush-meat has been one of their main sources of protein in the past and hunting for bush-meat is a major component of rural livelihood strategies in the tropical forest zone of West and Central Africa (Kümpel et al., 2010). In Ghana, local communities can obtain a licence from the Wildlife Division to hunt in community land during the open season.

The benefits could also be of cultural and religious/spiritual value. In some cases, the protected area may contain a sacred grove or totemic animals. The local communities derive cultural and religious/spiritual reinforcement by interacting with such animals. For example, Saniba (2010) describes a sacred grove inside Shai Hills Resource Reserve in Ghana, which the local people are allowed to enter to perform yearly rituals.

The provision of ecological services is yet another positive impact that communities adjacent to national parks enjoy. Ecological services includes: provisioning services like food and water; regulating services such as regulation of floods, droughts and land degradation; and supporting services such as soil formation, and nutrient cycling (Millennium Ecosystem Assessment, 2005). Ecosystem regulating services may provide microclimates that make farming around PAs more productive.

Despite the benefits, living near national parks can also generate concerns such as: crop depredation, livestock attacks by wildlife, poaching by local communities, and disease transmission to wildlife, livestock, and humans. Crop depredation is one of the most common concerns raised by communities living around PAs. Wildlife that damage crops, livestock, or attack humans in tropical PAs include: elephants, rodents, primates such as baboons and monkeys, and carnivores like lions, leopards and hyenas. Crop damage caused by raiding wildlife is a prevalent form of human-wildlife conflict along PA boundaries in the tropics (Naughton-Treves, 1998; Fungo, 2011). Wildlife implicated in attacks on livestock include lions, leopards and hyenas (Nkanda and Parker, 2008) cheetahs (Selebatso et al., 2008; Sillero-Zubiri et al., 2007) as well as baboons (Mulu, 2010; Dickman, 2013).

Poaching is another concern and a major problem for the conservation of wildlife populations in many parts of Africa. Poaching is driven by a number factors including the local demand for bush-meat and as a source of income for those living adjacent to PAs (Knapp et al., 2010). Poaching impacts wildlife, with implications for conservation, and also impacts communities. Although poaching may be carried out by only a small segment of the population, communities associated with poaching are branded and stereotyped. Such communities become the target of park law enforcement units and sometimes innocent people may suffer for the wrongful actions of a few.

Disease transmission from wildlife to livestock and human and is another concern that occurs in tropical PAs. Some authors contend that three quarters of all emerging infectious diseases of humans are zoonotic, with most originating in wildlife (Taylor et al., 2001; Chomel et al., 2007; Jones et al., 2008). As the interfaces between wildlife, domestic animals, and humans increase and become more complex, wildlife may become increasingly involved in emerging diseases (Rhyan and Spraker, 2010). However, given the epidemiology and transmission pathways of some diseases, disease risks are unfamiliar to many people (Decker et al., 2010).

The concerns and benefits of living adjacent to a PA may be affected by a number of factors. These include the distance of the community from the park boundary, governance arrangements, and the cultural values of the community. The distance of a community from the park boundary affects the way that concerns and benefits are perceived. Generally, the proximity of farms to the park boundary lines has been the strongest predictor of crop raiding by elephants (Naughton-Treves, 1998; Sam et al., 2005) and livestock predation, which have serious implications for sustaining rural livelihoods (Patterson et al., 2004; Holmern et al., 2007; Namgail et al., 2007). In northern Botswana, Gusset et al., (2009) reports that conflicts involving the two largest predator species (lion and spotted hyena) declined with increasing distance from PAs.

Protected area governance also affects the way that local communities perceive costs and benefits. Community-based Natural Resource Management (CBNRM) is a form of governance thought to help local communities embrace conservation. According to IUCN (2005), CBNRM is both a conservation and rural development strategy tool, involving community mobilisation and organisation, institutional development, comprehensive training, enterprise development, and monitoring of the natural resources base. Community Resource Management Areas (CREMA) is a variant form of CBNRM found in Ghana.

Traditional area affiliations and associated cultural values also influence how park adjacent communities perceive costs and benefits. Traditional cultural values, leadership style, and local governance systems may lead to different levels of conservation consciousness (Dearden et al., 1996). Many communities may have different cultural

values for different wildlife species. For example, in Boabeng-Fiema Monkey Sanctuary in Ghana a sacred grove that protects two monkey species Black and White Colobus and the Mona monkey, the community members tolerate the monkeys coming home to eat their food stuff. They regard the monkeys as having the spirits of the ancestors (Sammy, 2010) and are revered and tolerated.

Conserving wildlife that damages crops, livestock or attacks humans poses special challenges. Worldwide efforts to balance human needs with those of wildlife have generated a lot of interest, and striking an optimal balance requires solutions that are scientifically sound and socio-politically acceptable (Treves et al., 2009). The degree to which communities support and participate in conservation will depend on the value that people place on wildlife (Sillero-Zubiri and Laurenson, 2001) and PAs in general. This value is likely to be a function of costs/concerns. For example livestock losses or threats to human lives will be weighed against tourist revenues or cultural enhancement (Gusset et al., 2009). PAs do not necessarily impoverish nearby communities. Several studies have shown that PAs may have an overall positive economic impact on communities on the edges of PAs and this advantage may draw people to the communities (Ferraro, 2002; Wittemyer et al., 2008; Andam et al., 2010).

Attitudes of community residents toward nearby protected areas are linked to the way people perceive the flow of costs and benefits from protected areas, and this assessment can be situated within social exchange theory (SET). SET posits a series of interactions that generate obligations and that relationships evolve over time into trusting, loyal, and mutual commitments (Emerson, 1976). People engage in an interaction process where they seek something of value, be it material, social, or psychological, and choose to engage in an exchange once they have judged the rewards and the costs of such an exchange (Andereck et al., 2005). Perceptions of the exchange can vary in that an individual who perceives a positive outcome will evaluate the exchange in a different way than an individual who perceives it negatively. From a conservation perspective, SET postulates that an individual's attitudes toward conservation and the subsequent level of support for it will be influenced by his or her evaluation of resulting benefits and costs.

National parks are very important in the conservation of biodiversity resources, particularly in developing countries such as Ghana. However, the success of national parks as a conservation strategy depends on the support of the nearby community. If the cost of living near national parks are excessive compared to the benefits, community support for conservation may decline and anti-conservation behaviours such as poaching may arise. The concerns and benefits may differ depending on community's distance from the park boundary, PA governance arrangement, and leadership influence and cultural perspectives based on the traditional areas. This study examines the concerns and benefits of park adjacent communities in Mole National Park (MNP), Ghana. In particular, it addresses the following research questions:

1. What is the overall attitude of adjacent communities towards MNP?
2. What are the perceived concerns and benefits of living near MNP?
3. What are the factors that explain the differences in perception of concerns and benefits in the communities?

3.2 The Study Area

Mole National Park is Ghana's largest protected area. Situated between Wa and Tamale, the park covers about 4,577 km² (Figure 4) and lies between 9° 11' and 10° 10' N, and between 1° 22' and 2° 13' W, (MNP, 2011).

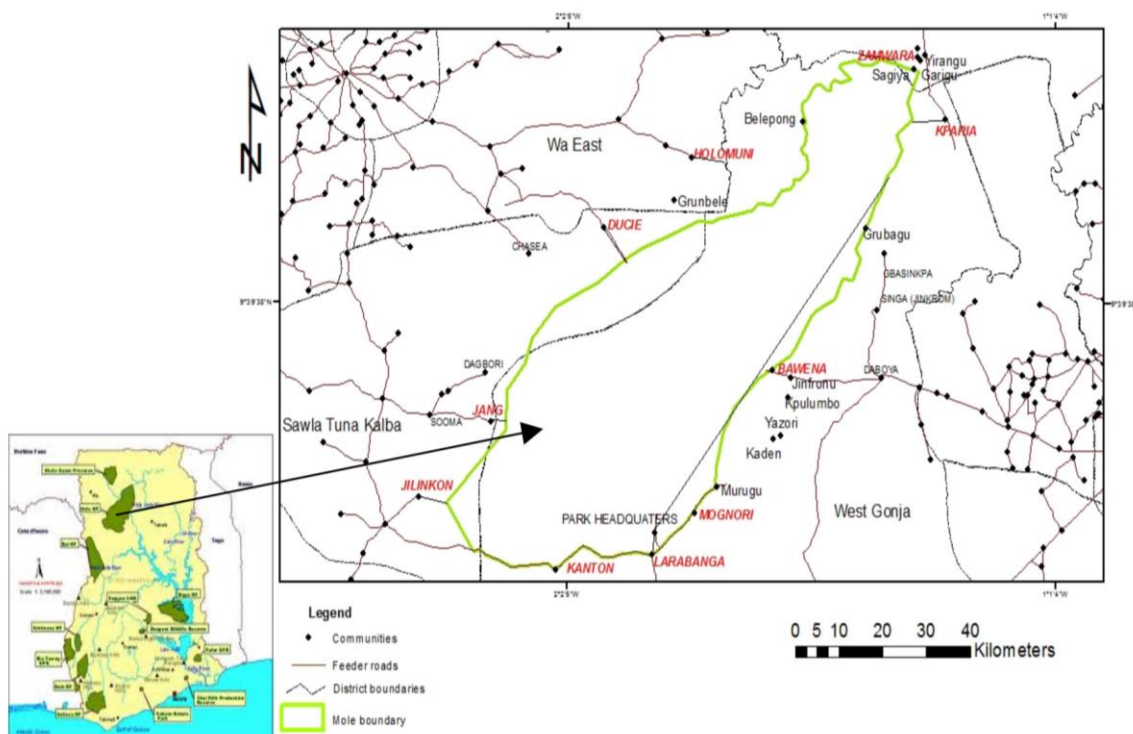


Figure 4: Map of Mole National Park showing adjacent communities

In 1971, it was gazetted as a national park for its outstanding wildlife and also to protect representative ecological habitats. In 1958, Mole Game Reserve was established, enclosing some traditional hunting grounds and sacred sites. Six villages were included and as the area was a traditional Gonja hunting ground, hunting camps were widely scattered within the reserve. In 1964, the villages were evacuated and more than 500 people were removed. Nyanga, the largest village in the middle of the reserve, was the last village to be evacuated. Mole was legally gazetted as National Park in 1971 under the Wildlife Reserve Regulations (LI 710) and its area was enlarged to 4,554km² by extending the boundaries north to the Kulpawn River and eastward over the Konkori escarpment. In 1992, the Park was further enlarged to its present size of about 4577 km² with the addition of the Gbantala triangle. The villagers from Gbantala were relocated and compensated at the end of 1992 (MNP, 2011).

The communities surrounding MNP occupy three traditional areas: Gonja, Wa and Mamprusi. The system of traditional governance is such that authority is hierarchical headed by chiefs. Power is then divided into tiers in terms of divisions, sub-divisions, towns, and villages. The land is invested in the chiefs who hold it in trust for the people.

The day to day affairs of the people is governed by the village chief who reports to the divisional chiefs and the divisional chiefs to the paramount chief. Community members are mainly subsistence farmers who also rear livestock, hunt, and gather wild fruits and other NTFPs. In 1994, the park was surrounded by about 27 communities totalling roughly 18,500 people who made use of resources such as grass for thatch roofing, wild fruits, and hunting wildlife. Currently there are 33 communities in the vicinity with a population of about 40,000 people, who still make use of the Park's resources in diverse ways (MNP, 2011).

Some of the communities surrounding the park have CREMAs while others do not. A CREMA is defined as “*any geographically defined area outside a protected area which is endowed with sufficient natural resources, and where communities have organised themselves for the purpose of sustainable resource management*” (GWD, 2004; MNP, 2005). The objectives of CREMAs are to promote the sustainable extraction of various harvestable botanical products/resources as well as promote conservation-oriented activities that support the local economy (MNP, 1994). Ten communities were selected for the study based on number of communities in a traditional area, proximity to the park and CREMA involvement (Table 15).

Table 15: The list of communities selected for the study

Community	Traditional Area	Non-CREMA (No) CREMA (Yes)	Distance from the park (km)	Coordinate(W)	Coordinate (N)
Kananto	Gonja	No	0.1	2°3'33.546"	9°11'36.599"
Larabanga	Gonja	No	0.2	1°51'39.924"	9°13'16.121"
Bawena	Gonja	No	0.2	1°36'38.067"	9°32'49.487"
Mognori	Gonja	Yes	0.3	1°46'13.009"	9°17'43.702"
Zanwara	Mamprusi	No	2.6	1°18'31.521"	10°5'49.523"
Jang	Gonja	No	3.8	2°11'41.366"	9°27'18.661"
Jelinkon	Gonja	Yes	6.9	2°20'49.985"	9°19'15.15"
Holomuni	Wa	No	7.9	1°46'44.432"	9°55'8.947"
Kparia	Gonja	No	8.0	1°14'54.492"	9°59'12.688"
Ducie	Wa	No	8.5	1°57'45.961"	9°47'51.209"

3.3 Methods

Key informant interviews, focus group meetings, field observations and questionnaire surveys were completed in order to provide rich data and triangulation through converging lines of inquiry (Yin, 2009). These methods were approved by the University of Victoria Human Research Ethics Board.

3.3.1 Key informants

Key informants were used to gather primary information relating to human-wildlife issues such as a community's perception of wildlife, the impact of wildlife and its effect, and methods of mitigation. The participants included a mix of individuals of different ages, gender, ethnicity, and position in the community. They included knowledge holders like chiefs, traditional leaders, elders and members of Protected Area Management Advisory Units (PAMAUs) of the park, as well as park staff, Non-Governmental Organizations (NGOs), district assembly officials, and representatives from identifiable groups in the communities such as bee keepers. At least two key informants in each of the ten adjacent communities were interviewed making a total of 21 key informant interviews. The interviews were conducted using a semi-structured interview guide and lasted from about 45 to 90 minutes. Information gathered from the key informants was followed by focus group meetings.

3.3.2 Focus groups

The focus group meetings were a follow up to the key informant interviews. The issues raised by the key informants were discussed at a group level and possible solutions were found for them. The participants for focus group meetings were selected from informal groups such as traditional leaders, women's groups, youth groups, hunters, farmers, livestock keepers, and bee keepers. Recruitment was conducted by making initial contact with key individuals in the communities, after which word of mouth was used to identify others. There were at least six to eight participants in each group; however, some of the groups attracted more people as the meeting continued. The discussions were facilitated using a semi-structured interview guide and lasted between two and three hours. At least one focus group meeting was held in each of the ten adjacent communities resulting in a total of 11 focus group meetings. The information

gathered from the key informants and the focus group meetings were corroborated through field observations.

3.3.3 Field observations

Field observations were used to verify the information gathered from the key informants and the focus groups. Notes and photographs of wildlife impacts such as crop raiding, trampling, livestock attacks and signs of poaching were taken. The information gathered from the key informants, focus groups and field observations were used to refine the questionnaire used in the household survey.

3.3.4 Household surveys

Household surveys (Appendix G) were used to sample the views of the broader community on the issues raised by the key informants and the focus groups. The questionnaires consisted mainly of close-ended questions and included five main parts: wildlife impact, concerns and benefits, strategies to enhance and mitigate human-wildlife interactions, the community's perceptions of tourism, and a demographics section. The concerns and benefits section was used for this paper. The survey was pre-tested in two communities and further refined before the actual survey.

Three research supervisors/assistants, one from each of the three traditional areas were recruited and trained to help with the field research. An additional twenty research assistants (two teachers from each community) were recruited to cater for the different languages in the ten communities and trained to conduct the survey. The teachers were natives of the local communities. As part of the training, the research assistants were asked to answer the questionnaires themselves and this was followed up by a debriefing with the principal researcher. In total the research team consisted of 24 people: the principal researcher, three research supervisors, and 20 research assistants (two school teachers in each community). The research supervisors and research assistants were trained by the principal researcher. In addition, daily debriefing was conducted to ensure quality control during the administration of the survey questionnaires.

The households were stratified into different ethnic groups according to the settlement patterns. The households were then numbered and by lottery technique, participants were randomly recruited from each stratum based on gender and age. The

research assistants (two teachers) from each community were supervised to conduct the surveys. The research assistants read the questionnaire to the respondents and filled out the resulting answers which lasted for about 30-60 minutes. There were daily debriefing to resolve outstanding issues before the next day. Fifty questionnaires were completed in each of the ten communities culminating in 500 surveys. In some communities more than 50 people were approached before the 50 per community target was reached. However, generally the community participation was high, about 90% of the people approached completed the survey. Dolsen and Machlis (1991) suggest that a response rate of 60% can be considered sufficient in accurately representing the population being sampled, while 70% is considered very good (Babbie, 2012). Thus, the over 90% response rate can be considered adequate representation of the communities adjacent to Mole.

This high response rate was as a result of the proper entry protocols observed and the involvement of local residents as research assistants. The protocol used was as follows: in each community, the chief's palace was visited first, gifts presented, and the research mission explained. A message was then sent by the chief to the whole community about the study and this made the respondents very receptive to the survey.

The key informant interviews, focus groups, and field observation started in November, 2011 but training of research assistants and the survey was conducted from January, 2012 to November, 2012. Questions from Q4, Q6, Q7, Q9, Q10, Q11, Q19, Q22, and Q23 of Appendix G were used for this chapter. The data-set collected was coded and analyzed using IBM SPSS version 21 and Office 2013 Microsoft Excel.

3. 4 Results and Discussions

3.4.1 Overall attitude towards Mole and perception of concerns and benefits

Respondents were asked to rate their overall attitude towards Mole (Q11 of Appendix G) on a five-point Likert scale ranging from 1 "very positive" to 5 "very negative," (Figure 5).

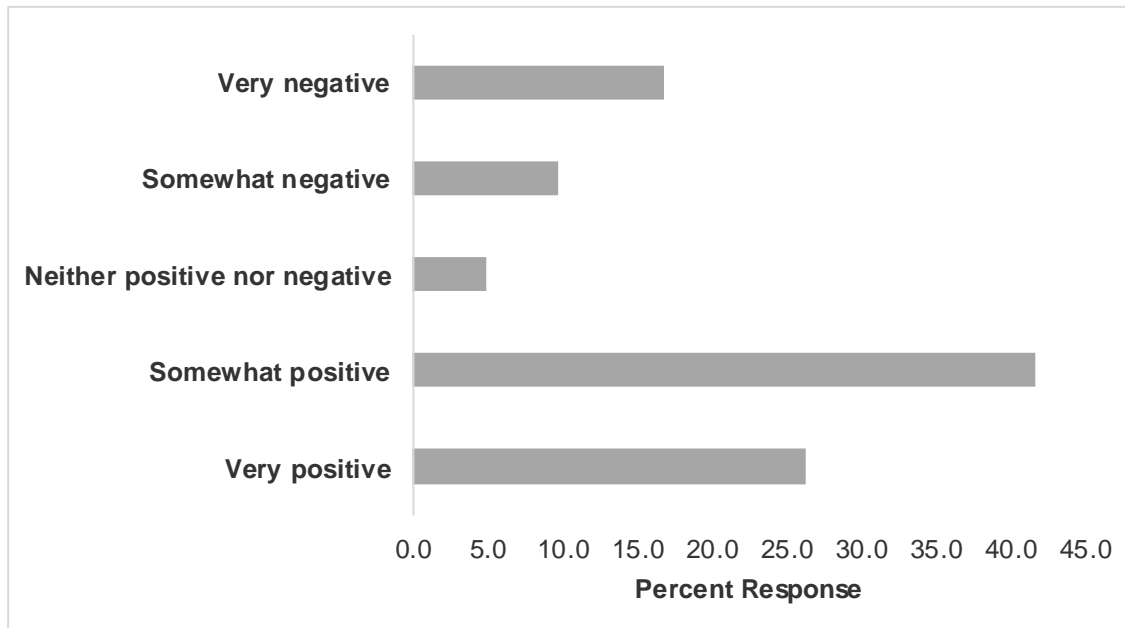


Figure 5: Adjacent communities overall attitude towards Mole National Park

The overall attitude towards the park fell within very positive (26.4%) and somewhat positive (41.9%) categories which accounted for 68.3% of the responses. Only 5% of respondents had no opinion about the park, whereas 16.9% were very negative and 9.8% somewhat negative.

Respondents were also asked to rate their perception of living near MNP in terms of costs and benefits on a five-point Likert scale (Figure 6).

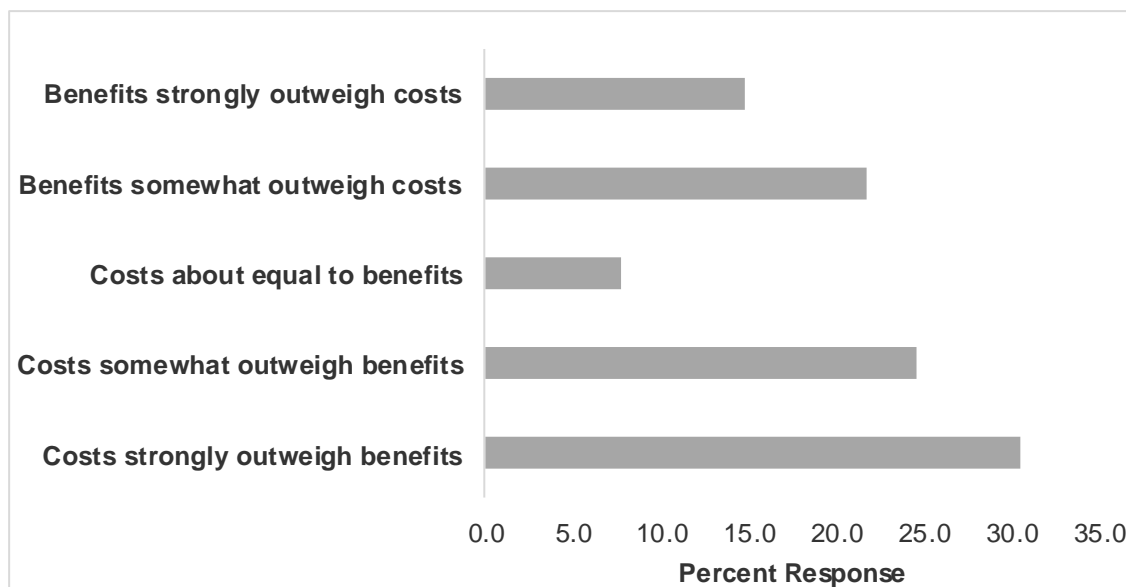


Figure 6: Adjacent communities overall perceptions of concerns and benefits of Mole National Park

The overall perception of the park in terms of costs and benefits fell within “the costs strongly outweigh the benefits” (30.7%) and “the costs somewhat outweigh the benefits” (24.7%) categories, totaling 55.4% of the responses. Only 7.8% of respondents had no opinion about the costs and benefits of the park whereas 21.9% responded that “the benefits somewhat outweigh the costs” and 14.9% that “the benefits strongly outweigh the costs.”

Most people have an overall positive attitude towards the park. However, their responses to specific concerns and benefits show mixed perceptions of the park. More than half of the respondents think that the cost of living near the park outweighs the benefits. This seemingly contradictory view could be due to the losses they incur particularly from crop depredation and attacks on livestock. Some literature suggests that often people are in agreement about the desirability of large and general goals (for example, conservation, saving the whales, sustainable fisheries), but have much lower levels of agreement to specific details and approaches (Lunn and Dearden 2006). Local communities may appreciate the value of the park both for themselves and future generations, but, at the same time, are keenly aware of some of the daily challenges to their livelihoods presented by the park. Nonetheless, this apparent contradicting posture of park-adjacent communities cannot be over looked. Perceptions shape behaviours and it

is important for PA managers to address these concerns. Baral and Heinen (2007) point out that benefits should outweigh costs to entice people to support conservation.

3.4.2 Perceived concerns and benefits

Given the high illiteracy rate in the adjacent communities a four point Likert scale of concerns and benefits was used to make it simple for the communities to appreciate. Respondents were asked to score possible concerns of living near Mole (Q4 of Appendix G) using a four-point Likert scale (Table 16).

Table 16: Perceived concerns of adjacent communities in descending order

Concerns	Percentage of responses				Mean	Std. Dev.
	1	2	3	2+3		
Loss of farmlands	2.8	20.4	76.8	97.2	2.74	0.50
Crop depredation	3.8	26.4	69.8	96.2	2.66	0.55
Livestock attacks by wildlife	20.8	30.5	48.8	79.2	2.28	0.79
Loss of access to perform rituals	17.2	38.3	44.5	82.8	2.27	0.74
Lack of access to NTFPs	12.5	54.0	33.5	87.5	2.21	0.65
Lack of pasture	26.7	32.4	40.9	73.3	2.14	0.81
Hunting destruction of the environment	18.6	49.2	32.2	81.4	2.14	0.70
Poaching	17.1	56.1	26.7	82.9	2.10	0.66
Support for conservation	26.8	48.2	25.1	73.2	1.98	0.72
Living in fear because of wildlife	35.9	31.8	32.2	64.1	1.96	0.83
Attack on humans by wildlife	47.3	31.1	21.5	52.7	1.74	0.79
Wildlife attacks on pets	52.2	31.3	16.4	47.8	1.64	0.75
Disease transmission to human	65.9	22.8	11.3	34.1	1.45	0.69
Disease transmission to livestock and pets	74.0	18.4	7.6	26.0	1.34	0.61
Tourist intrusion	80.9	9.3	9.7	19.1	1.29	0.63
Infrastructure damage	79.6	12.4	7.9	20.4	1.28	0.60
Culture adulteration	82.5	10.5	7.0	17.5	1.24	0.57

Likert Scale: 1=Not a concern, 2=Small concern, 3=Large concern, 4=Not sure, N=500. Mean scores computed from responses where 4 was recoded as missing.

In total, the top three concerns were: loss of farmlands, crop depredation and livestock attacks by wildlife.

Further, respondents were asked to select the three most important concerns from the list of possible concerns (Q6 of Appendix G) Table 17.

Table 17: The most important concerns of adjacent communities in descending order

Concerns	Percentage of responses			
	1st most important Concern	2nd most important Concern	3rd most important Concern	Total importance (1st, 2nd, and 3rd)
Crop depredation	51.6	19.0	11.6	82.2
Loss of farm lands	25.4	29.8	16.4	71.6
Lack of access to NTFPs	8.4	13.2	24.0	45.6
Poaching by local communities	3.4	7.6	7.6	18.6
Loss of access to perform rituals	1.6	6.4	10.6	18.6
Livestock attacks by wildlife	2.2	12.4	3.0	17.6
Hunting destruction of the environment	3.0	3.6	8.0	14.6
Lack of pasture	0.4	1.6	6.0	8.0
Living in fear because of wildlife	0.6	2.0	3.2	5.8
Attacks on humans by wildlife	1.8	1.4	2.4	5.6
Infrastructure damage by wildlife	0.6	0.6	3.0	4.2
Disease transmission to humans	0.2	0.8	2.0	3.0
Disease transmission to livestock and pets	0.0	0.6	1.0	1.6
Decreased support for conservation	0.2	0.4	0.6	1.2
Tourists intrusion	0.2	0.2	0.4	0.8
Pets attacks by wildlife	0.2	0.4	0.0	0.6
Culture adulteration	0.2	0.0	0.2	0.4
N=500				

Crop depredation, loss of farmlands, and loss of access to NTFPs were rated as the most important concerns (Table 16). Crop depredation and loss of farmlands were top two concerns in both Table 16 and Table 17 indicating a strong convergent validity.

Respondents were asked to score possible benefits of living near the park (Q7 of Appendix G) using a four-point Likert scale (Table 18).

Table 18: Perceived benefits of adjacent communities

Benefits	Percentage of responses				Mean	Std. Dev.
	1	2	3	2+3		
Increased conservation awareness	3.4	31.3	65.3	96.6	2.62	0.55
Provision of ecosystem services	6.7	29.1	64.2	93.3	2.58	0.62
Maintenance of cultural identity	22.2	43.5	34.3	77.8	2.12	0.74
Provision of religious/spiritual benefits	38.9	31.1	30.0	61.1	1.91	0.83
Increased visitation and overnight stay	48.9	16.0	35.0	51.1	1.86	0.91
More business opportunities	44.4	25.8	29.9	55.6	1.85	0.85
Attracted people to live in the community	47.1	22.3	30.6	52.9	1.84	0.87
Increased recreational activities	48.2	29.3	22.5	51.8	1.74	0.80
Provision of bush-meat	43.5	43.1	13.3	56.5	1.70	0.69
Improved infrastructure	58.3	21.8	19.9	41.7	1.62	0.80
Likert Scale: 1=Not a benefit, 2=Small benefit, 3=Large benefit, 4=Not sure, N=500. Mean scores computed from responses where 4 was recoded as missing.						

The top three benefits were: increased conservation awareness, provision of ecosystem services, and maintenance of cultural identity. Further, respondents were asked to select three most important benefits from the list of possible benefits (Q9 of Appendix G). The provision of ecosystem services, increased conservation awareness, and maintenance of cultural identity were rated as the most important benefits (Table 19) demonstrating strong convergent validity with Table 18.

Table 19: The most important benefits of adjacent communities in descending order

Benefits	Percentage of responses			
	1st most important Benefit	2nd most important Benefit	3rd most important Benefit	Total Benefit (1st, 2nd,& 3rd)
Provision of ecosystem services	41.8	26.2	13.4	81.4
Increased conservation awareness	24.4	31.8	11.4	67.6
Maintenance of cultural identity	4.4	8.2	36.8	49.4
More business opportunities	6.6	13.4	8.4	28.4
Provision of bush-meat	5.8	5.0	15.4	26.2
Increased visitation and overnight stay	11.8	5.2	3.4	20.4
Attracted people to live in the community	1.4	4.0	3.4	8.8
Provision of religious/spiritual benefits	1.2	1.8	4.4	7.4
Improved infrastructure	2.4	3.0	1.0	6.4
Increased recreational activities	0.2	1.4	2.4	4.0
N=500				

3.4.3 Understanding differences in the perception of concerns and benefits

The results discussed above reveal some interesting differences in attitudes towards Mole raising questions about what influences these attitudes. In this section the factors that explain these differences are discussed.

3.4.3.1 Classification tree

Recursive Partitioning (rpart), a decision support software using a classification tree, was used to determine the strongest predictor of attitude towards Mole (Figure 7).

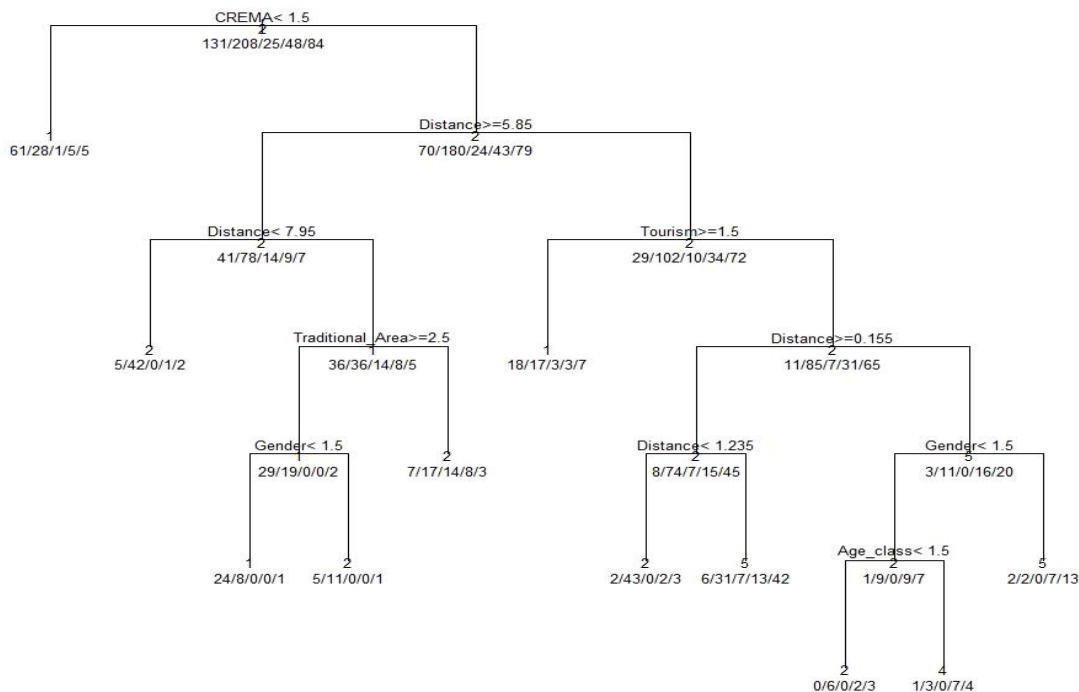


Figure 7: Classification tree showing factors that predict attitude towards Mole National Park

Classification trees use algorithms to predict membership of cases/objects in the classes of a categorical dependent variable from their measurements on one or more predictor variables (Breiman et al., 1984). In this paper, the categorical dependent variable was attitude towards Mole (Q11 of Appendix G) and the predictor variables were CREMA involvement, tourism involvement, community distance from the park, community traditional area affiliation, respondent age groups and gender.

The classification tree method uses binary splitting rules to partition the response variable into homogenous classes, which in this study was a Likert Scale with a score of 1 corresponding to “very positive,” 2 to “somewhat positive,” 3 to “neither positive nor negative,” 4 to “somewhat negative” and a score of 5 as “very negative.” There are numbers associated with the predictor variables. For example CREMA<1.5 refers to the decision rule used in the construction of the tree. The numbers at the end of each binary split represent the frequency of responses of each Likert Scale response from 1 to 5. For example, at the first split CREMA, 131 persons selected 1, 208 selected 2, 25 selected 3, 48 selected 4, and 84 selected 5. The numbers 1, 2, 3, 4 and 5 at the end of the nodes are

the model's predicted Likert Scale attitudes towards Mole and are created from the highest class frequency.

From the classification tree, CREMA involvement is the most important predictor of attitude towards Mole, followed by distance from the park, tourism involvement, traditional affiliation, gender and age groups. The variables used in the classification tree were tested to explain the variability of perceived concerns and benefits of the adjacent communities.

3.4.3.2 CREMA involvement

An Independent-Samples T Test comparison of concerns by CREMA involvement showed that ten out of 17 concerns were significantly different between the communities (Table 20).

Table 20: Comparison of perceived concerns by CREMA involvement

Concerns	CREMA		non-CREMA		t	df	Sig. (2-tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Loss of farm lands	2.94	0.24	2.69	0.53	7.00	361.58	0.00
Livestock attacks by wildlife	2.87	0.39	2.13	0.79	13.20	323.73	0.00
Crop depredation	2.73	0.45	2.64	0.57	1.65	188.65	0.10
Hunting destruction of the environment	2.62	0.63	2.01	0.66	8.25	492.00	0.00
Lack of pasture	2.44	0.67	2.06	0.82	4.77	180.71	0.00
Lack of access to NTFPs	2.29	0.67	2.19	0.64	-1.53	492.00	0.13
Decreased support for conservation	2.18	0.81	1.93	0.68	2.84	138.09	0.01
Loss of access to perform rituals	2.17	0.74	2.30	0.73	-1.53	492.00	0.13
Poaching by local communities	2.13	0.75	2.09	0.63	0.54	135.01	0.59
Living in fear because of wildlife	2.03	0.73	1.95	0.85	0.99	173.87	0.32
Wildlife attacks on pets	1.91	0.48	1.57	0.79	5.37	258.82	0.00
Attacks on humans by wildlife	1.78	0.80	1.73	0.79	0.54	486.00	0.59
Tourists intrusion	1.68	0.84	1.18	0.52	5.64	119.97	0.00
Infrastructure damage by wildlife	1.49	0.69	1.23	0.56	3.45	133.25	0.00
Culture adulteration	1.35	0.63	1.22	0.55	1.94	142.78	0.05
Disease transmission to livestock and pets	1.33	0.56	1.34	0.63	-0.11	406.00	0.91
Disease transmission to humans	1.33	0.60	1.49	0.71	-2.14	151.83	0.03

Likert Scale: 1=Not a concern, 2=Small concern, 3=Large concern, 4=Not sure.
Mean scores computed from responses where 4 was recoded as missing.
CREMA N=100, non-CREMA N= 400

The mean scores of CREMA communities were higher than that of non-CREMA communities indicating greater perceived concerns except disease transmission to humans.

Similarly, an Independent-Samples T Test comparison of perceived benefits by CREMA and non-CREMA communities showed that nine out of 10 benefits were significantly different between the communities (Table 21). The mean scores of CREMA communities were higher than that of non-CREMA communities indicating greater perceived benefits.

Table 21: Comparison of benefits by CREMA involvement

Benefits	CREMA		non-CREMA		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Increased visitation and overnight stay	2.87	0.42	1.59	0.81	21.66	311.82	0.00
Increased conservation awareness	2.87	0.34	2.56	0.58	7.05	261.67	0.00
Provision of ecosystem services	2.76	0.45	2.53	0.64	4.07	207.58	0.00
More business opportunities	2.72	0.53	1.63	0.77	16.45	217.79	0.00
Maintenance of cultural identity	2.71	0.46	1.97	0.73	12.64	246.33	0.00
Attracted people to live in the community	2.64	0.56	1.62	0.81	14.59	219.85	0.00
Increased recreational activities	2.44	0.59	1.55	0.74	12.53	193.10	0.00
Provision of religious/spiritual benefits	2.43	0.68	1.77	0.81	8.19	174.55	0.00
Improved infrastructure	2.30	0.76	1.44	0.71	10.68	480.00	0.00
Provision of bush-meat	1.78	0.73	1.68	0.68	1.31	485.00	0.19
Likert scale of benefits, 1=Not a benefit, 2=Small benefit, 3=Large benefit, 4=Not sure. Mean scores computed from responses where 4 was recoded as missing. CREMA N= 100, non-CREMA N=400							

According to the classification tree (Figure 7) CREMA involvement is the most important predictor of attitude towards Mole. Most of the perceived concerns are significantly different between CREMA and non-CREMA communities. The CREMA communities perceived concerns higher than non-CREMA communities.

Loss of farm lands and lack of pasture to feed livestock are general concerns of the adjacent communities. Loss of farm lands was rated as one of the top three concerns of the communities adjacent to Mole. The situation may be aggravated in CREMA communities, because of the creation of the CREMA which further limits available farm lands and may explain why these concerns were rated higher in CREMA communities than non-CREMA communities.

Livestock attacks by wildlife is also one of the general concerns of the adjacent communities and particularly acute in communities closer to the park headquarters. One

of the CREMA communities, Mognori is very close to the park boundary line and also closer to the park headquarters. According to the park records it is one of the hot spots where crop raiding and attacks on livestock occurs (MNP, 2011). During the studies, the community members alleged that hyenas have attacked their goats and showed the supposed tracks of the hyenas to the principal investigator. This close proximity may account for why livestock attacks by wildlife, and pet attacks by wildlife were rated high in the CREMA communities.

Greater perceived concerns about the destruction of the environment through hunting in CREMA communities may not necessarily be due to community members hunting, but instead due to the activities of nearby communities. As an example, in Jelinkon, a CREMA community, the bushbuck is a taboo animal and the community is very concerned about hunting activities of nearby communities who do not taboo the bushbuck. There was also an incident when some nearby community members wanted to pass through Murugu-Mognori CREMA to poach in the park but were prevented by the CREMA community members. Also, in the establishment of CREMAs, extensive conservation education is undertaken in the communities by the park staff. This is sometimes followed up by NGOs for example, "A Rocha Ghana" in the case of Mognori CREMA. This kind of sensitization may make CREMA communities more conservation conscious which may explain why "destruction of the environment through hunting" was rated higher in CREMA communities than non-CREMA communities.

Destruction of infrastructure by wildlife as a higher concern in CREMA communities may be due to the activities of baboons. Baboons are mischievous and jumps on roofs of buildings. There is high population of baboons around the park headquarters. They troop to the nearby communities in search of food. Mognori on of the CREMA communities experience high encounters with baboons and their activities leads to the destruction of infrastructure.

The rating of tourists' intrusion and cultural adulteration higher in CREMA communities than non-CREMA communities is also because of Mognori which experience high tourist visitation. According to the Mognori Eco-Village project manager, tourist number have risen from 216 in 2007 to 1120 in 2011. The tourists flow

brings substantial income to the village. However some activities of some tourists are tantamount to intrusion of privacy and also adulteration of culture.

Only disease transmission to humans was rated as higher concern in non-CREMA communities than CREMA communities. Mole National Park, prior to the creation of the park used to be a tsetse fly clearance zone. Although the insect numbers have substantially reduced in the park, they are still present in some portions of the park and associated with large ungulates such as buffalos and antelopes. Communities closer to such area may get some form of the insect's disturbance. Sandflies are also present in some parts of the park and are nuisance to communities where they are present. These may explain why disease transmission to humans were rated higher in non-CREMA communities which were eight in the study compare to CREMA communities which were two.

The recognition of benefits was significantly different in CREMA and non-CREMA communities, with a higher appreciation of the benefits in the CREMA communities. Nine out of the ten benefits listed were rated as high benefits in CREMA communities. This could be attributed to the close collaboration the CREMA communities have with the park. The collaboration and cooperation between the park and CREMA communities may lead to increased conservation awareness and an appreciation for ecosystem services. Increased conservation awareness as a higher benefit in CREMA communities is consistent with literature which suggests that CBNRM plays a leading role in conservation strategies (Jones and Murphree, 2004; Dressler et al., 2010) and local resource management encourages local participation and the decentralization of the benefits of wildlife use increases local benefits and stimulates community interest in resource management (Sebele, 2010).

Improved infrastructure, increased visitation, the provision of more business opportunities, and attracting people to live in the community were perceived as more beneficial in CREMA communities than non-CREMA communities. This could be due to the support that the communities enjoy from integrated conservation and development projects. This view is supported by Wittemyer et al., (2008) who, in a meta-analysis of studies, found that overall communities on the edges of PAs benefit more from integrated and conservation projects and more economic opportunities that draw people to the

communities. CREMA communities near MNP have benefited from a number of projects that may be due to their collaboration with the park and their accessibility. In the selection of communities for interventions and projects, either by the park, or perhaps more importantly NGOs, ease of accessible roads to the community is a factor. Hence the two CREMA communities, Jelinkon and Mognori, by virtue of relatively good access roads and good rapport with the park enjoy benefits in terms of projects and interventions. That may explain why the majority of the benefits were perceived to be higher in CREMA communities than in non-CREMA communities.

3.4.3.3 Community distance from the park

An Independent-Samples T Test comparison of concerns by community distance from the park (Table 22) showed that 16 of 17 concerns were significantly different between “communities less than 2km” and “communities more than 2km” from the park. The mean concern scores were generally higher in “communities less than 2km” from the park.

Table 22: Comparison of concerns by community distance from the park

Concerns	Communities less than 2km		Communities more than 2km		t	df	Sig. (2-tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Loss of farmlands	2.92	0.28	2.62	0.57	7.58	460.08	0.00
Crop depredation	2.91	0.29	2.50	0.61	9.93	458.27	0.00
Lack of pasture	2.58	0.59	1.85	0.81	11.64	481.67	0.00
Livestock attacks by wildlife	2.51	0.69	2.12	0.81	5.68	462.84	0.00
Loss of access to perform rituals	2.48	0.72	2.14	0.72	5.17	492.00	0.00
Lack of access to NTFPs	2.35	0.63	2.12	0.64	3.97	424.39	0.00
Hunting destruction of the environment	2.33	0.73	2.01	0.65	4.91	380.75	0.00
Poaching by local communities	2.30	0.70	1.96	0.59	5.52	362.80	0.00
Living in fear because of wildlife	2.27	0.80	1.75	0.78	7.17	488.00	0.00
Decreased support for conservation	2.19	0.63	1.83	0.74	5.71	451.77	0.00
Wildlife attacks on humans	2.07	0.82	1.52	0.68	7.86	373.68	0.00
Wildlife attacks on pets	1.95	0.86	1.43	0.57	7.42	311.37	0.00
Disease transmission to livestock and pets	1.54	0.75	1.19	0.43	5.50	255.05	0.00
Disease transmission to humans	1.53	0.78	1.40	0.61	1.89	324.58	0.06
Tourists intrusion	1.50	0.83	1.14	0.40	5.57	252.55	0.00
Infrastructure damage by wildlife	1.38	0.70	1.22	0.51	2.79	318.32	0.01
Culture adulteration	1.37	0.71	1.16	0.43	3.63	288.32	0.00

Likert scale of concerns, 1=Not a concern, 2=Small concern, 3=Large concern, 4=Not sure. Mean scores computed from responses where 4 was recoded as missing. Communities less than 2km N=200, Communities more than 2km N=300

Similarly, an Independent-Samples T Test comparison of benefits by community distance from the park (Table 23) showed that seven out of 10 benefits were significantly different between “communities less than 2km” and “communities more than 2km” from the park. The mean benefit scores were higher in “communities closer to the park than communities farther away from the park except improved infrastructure which was higher in the “communities more than 2km” from the park than “communities less than 2km” from the park.

Table 23: Comparison of benefits by community distance from the park

Benefits	Communities less than 2km		Communities more than 2km		t	df	Sig. (2-tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Provision of ecosystem services	2.79	0.49	2.43	0.65	7.08	486.45	0.00
Increased conservation awareness	2.72	0.49	2.56	0.58	3.30	468.04	0.00
Maintenance of cultural identity	2.32	0.71	1.98	0.74	5.09	479.00	0.00
Attracted people to live in the community	2.04	0.83	1.70	0.87	4.32	433.14	0.00
Increased visitation and overnight stay	1.97	0.89	1.78	0.91	2.20	472.00	0.03
Provision of religious/spiritual benefits	1.94	0.75	1.89	0.87	0.58	441.94	0.56
More business opportunities	1.91	0.86	1.81	0.84	1.27	487.00	0.20
Provision of bush-meat	1.80	0.77	1.63	0.63	2.56	356.53	0.01
Increased recreational activities	1.77	0.71	1.72	0.86	0.74	455.70	0.46
Improved infrastructure	1.47	0.63	1.72	0.88	-3.65	478.89	0.00
Likert scale of benefits, 1=Not a benefit, 2=Small benefit, 3=Large benefit, 4=Not sure. Mean scores computed from responses where 4 was recoded as missing. Communities less than 2km N=200, Communities more than 2km N=300							

According to the classification tree (Figure 7), community distance from the park is the second most important predictor of attitude towards the park. The majority of the concerns were perceived higher in communities closer to the park than those farther away from the park except disease transmission to humans which was not statistically significant. Communities closer to the park: Kananto (0.1km), Larabanga (0.2km), Bawena (0.2km), and Mognori (0.3km) are virtually located on the boundary line. Their close proximity to the park generates a number of concerns which are greater than those farther away from the park. Crop depredation, livestock attacks by wildlife, and pet attacks by wildlife were rated as large concerns because of their close proximity to the park. Records from the park indicates that these communities report f crop depredation, livestock attacks by wildlife, and pet attacks by wildlife more frequently than communities farther away from the park. During the study, the principal researcher had an opportunity to visit a farm in Larabanga which has been raided by elephants.

Attacks on humans by wildlife and living in fear were also rated as larger concerns in communities closer to the park than those farther away from the park. In, 2010 a hyena attacked a mentally retarded woman in Kananto. This may have influenced the higher means scores of attacks on human by wildlife, and living in fear because of wildlife.

Poaching by local communities and destruction of the environment through hunting were equally rated high in communities in close proximity to the park. Some of the community members take advantage of their close proximity to the park to hunt illegally. Some of them have their farm very close to the boundary and use it as a bait to attract wildlife and illegally hunt them. Although, illegal hunting is carried out by only a few, the entire community suffers its consequences. Park staff may stereotype such communities as “poachers” and this may strain relationships with the park. It came to light during the key informant interviews and the focus group meetings that sometimes people from other places come to hide in the farmlands of the communities closer to the park and illegally hunt. However, it is difficult to tell where poachers come from unless they are arrested and identified. These may explain why poaching by local communities was rated high by communities closer to the park. Similarly, destruction of the environment through hunting was rated high in communities closer to the park. Various

methods are employed by people involved in illegal hunting such as the use of fire to flush out game. Occasionally such fires get out of hand and destroy vast areas of farmlands. So in communities where people indulge in illegal hunting, the community members are also worried about the destruction of the environment through hunting.

Loss of farmlands and lack of access to NTFPs are among the top three concerns in all the communities, but were rated as larger concerns in communities closer to the park than those farther away from the park. This is due to farmlands closer to the park not being attractive because of the high possibility of crop raiding. Such communities have to resort to using remaining farmlands which are farther away from the park. Judging from the complex nature of land tenure system in Ghana, some people become disadvantaged and may not have access to enough farmlands to provide for their families. The situation is more challenging for Kananto (0.1km) which is sandwiched between Mole National Park and Kenikeni Forest Reserve. According to the key informants and the focus group meeting, their situation is so serious that some of them have been given limited access into portions of the Kenikeni Forest Reserve to practice “Modified Tonga Farming System” as a pilot program. Modified Tonga Farming System is an agro-forestry practice that allowed farmers to grow food crop while taking care of tree plants. The farmers are allowed to continue farming until the trees mature and form a canopy. This may explain why “loss of farmlands” was a larger concern in communities closer to the park than those farther away from the park.

The NTFP needs of the adjacent communities include: poles for construction, thatch grass for roofing houses, broom grass, fuel wood, medicinal plants, and wild fruits particularly from multi-purpose trees such as African locust bean (*Parkia biglobosa*), and shea nut (*Vitellaria paradoxa*). Lack of access to NTFPs was a large concern in all the communities. However, it is rated as a greater concern in communities in close proximity to the park than the other communities. There have been proposals by previous management plans to allow sustainable harvesting of such NTFP resources (MNP, 1994; 2005). However, abuse by community members has made implementation of such plans very difficult. The limitation of the NTFP resources and the high probability of wildlife competing with adjacent community members, make it more challenging for communities in close proximity to the park. For example, elephants like to feed on shea

nut trees and in the process break the tree. Baboons and patas monkeys feeds on African locust bean thus competing with the communities for these resources outside the park. This corroborates the literature which suggests that the proximity of communities to PAs can result in farm losses through crop and livestock predation (Naughton-Treves, 1998; Sam et. al., 2005) and has implications for sustaining rural livelihoods (Patterson et al., 2004; Namgail et al., 2007).

Loss of access to perform rituals was also rated as a larger concern in communities in close proximity to the park than those farther away from the park. During key informant interviews and focus group meetings, it came to light that two of the communities: Kananto (0.1km) and Bawena (0.2km), have their shrines and gods located in the park. They have no access to perform rituals on these shrines and this is a source of discontentment for some community members. It is therefore not surprising that lack of access to perform rituals in the park was rated higher in communities closer to the park than those farther away from the park. The culmination of these concerns is decreased support for conservation which was rated higher in communities closer to the park than those farther away from the park.

Perceived benefits also show variation in relation to community distance from the park. In contrast to expectations, the benefits were rated higher in communities closer to the park than communities farther away from the park except improved infrastructure which was rated higher in communities farther away from the park than those in close proximity. Communities in close proximity to the park: Kananto (0.1km), Larabanga (0.2km), Bawena (0.2km), and Mognori (0.3km) are accessed by road through the Sawla – Ffulso laterite road which is often in poor condition particularly during rainy season. Although, the access road to the other communities farther away from the park are also laterite roads, some of them are comparably better than the Sawla – Ffulso road. In addition, one of the communities further away from the park: Jelinkon, has a bridge comparable to any good bridge on highway. These may account for why improved infrastructure was rated high in communities farther away from the park.

Other benefits such as increased recreational activities, increased conservation awareness, provision of bush-meat, maintenance of cultural identity, attracted people to live in the community, and increased visitation and overnight stay were all rated higher in

communities closer to the park than those farther away from the park. Communities closer to the park particularly Larabanga (0.2km), Bawena (0.2km), and Mognori (0.3km) who use the park headquarters road routinely see wildlife such as baboons, kobs, bushbucks, elephants, monkeys, and birds. Some of these wildlife are very entertaining such as baboons whereas others, like elephants, are very majestic. These experiences may account for the high rating of increased recreational activities in communities closer to the park.

The communities closer to the park are also located close to the park headquarters which make it easier for the park staff to reach them with conservation education. In addition, one of the communities Mognori has a community resource management area (CREMA). As a CREMA community, Mognori has benefited from a number of conservation initiatives prior to the establishment of the CREMA, and continues to enjoy close collaboration with the park and other NGOs. For example, “A Rocha Ghana” an NGO, continues to train CREMA executives, monitor CREMA activities, and also provide conservation education to the community. These activities account for why community in close proximity to the park rated increased conservation awareness higher than other communities.

It is interesting to note that provision of bush-meat was rated as a higher benefit in communities closer to the park than those farther away from the park. People can obtain a licence from the Wildlife Division and hunt grass-cutters outside parks and reserves. There is a spot in Larabanga where bush-meat especially grass-cutter is sold. Key informants claim that the source of the grass-cutter is not from the park but from other places. This may account for why provision of bush-meat was rated high in communities in closer to the park.

Maintenance of cultural identity was rated as a high benefit in all the communities. However, it was rated higher in communities closer to the park than those farther away from the park. Some park wildlife may be taboo or totemic animals and communities in close proximity to the park have a high probability of seeing these wildlife than those farther away from the park. As such they derive more cultural and spiritual benefits from wildlife and this may account for why communities in close

proximity to the park rated maintenance of cultural identity higher than those farther away from the park.

Communities' closer to the park such as Mognori and Larabanga are involved in tourism. These communities are attractive and received tourists as well as attract people to live in these communities because of the opportunities that tourism bring to the communities. Hence the benefits of "attracting people to live in the community" and "increased visitation and overnight stay" were rated as higher benefits in communities closer to the park than those farther away from the park. Wittemyer et al., (2008) suggest that communities on the edges of protected areas draw people to live in them because of the benefits that such communities enjoy. In this study, communities closer to the park such as Larabanga (0.2km), and Mognori (0.3km) have enjoyed many conservation integrated projects because of their location.

The general high rating of benefits by communities closer to the park than those farther away from the park is in contrast to what some literature suggests that communities closer to parks suffer mainly from crop depredation and livestock attacks by wildlife (Naughton-Treves, 1998; Sam et. al., 2005) and may have negative view of parks. Although, communities in close proximity to the park have a number of concerns, they still rated benefits higher than communities farther away from the park.

3.4.3.4 Tourism involvement

An Independent-Samples T Test comparison of concerns by tourism involvement showed that 13 out of 17 concerns were significantly different between the communities involved in tourism and non-tourism communities (Table 24).

Table 24: Comparison of concerns by tourism involvement

Concerns	Communities involved in tourism		non-tourism communities		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Crop depredation	2.99	0.10	2.58	0.58	-13.39	472.09	0.00
Loss of farmlands	2.89	0.31	2.70	0.53	-4.58	257.25	0.00
Livestock attacks by wildlife	2.69	0.66	2.18	0.78	-6.65	171.31	0.00
Lack of pasture	2.58	0.66	2.03	0.81	-6.99	172.18	0.00
Hunting destruction of the environment	2.47	0.72	2.05	0.67	-5.22	139.06	0.00
Poaching by local communities	2.37	0.76	2.03	0.61	-4.21	131.02	0.00
Lack of access to NTFPs	2.26	0.68	2.20	0.64	-0.78	494.00	0.44
Loss of access to perform rituals	2.15	0.82	2.30	0.71	1.74	131.79	0.08
Decreased support for conservation	2.13	0.77	1.94	0.70	-2.21	140.85	0.30
Wildlife attacks on pets	2.07	0.75	1.53	0.71	-6.55	467.00	0.00
Living in fear because of wildlife	2.01	0.83	1.95	0.82	-0.63	488.00	0.53
Tourists intrusion	2.00	0.94	1.11	0.35	-9.02	99.67	0.00
Wildlife attacks on humans	1.92	0.79	1.70	0.78	-2.55	486.00	0.01
Disease transmission to livestock and pets	1.75	0.86	1.23	0.48	-5.34	96.45	0.00
Disease transmission to humans	1.69	0.90	1.39	0.61	-2.85	106.35	0.01
Infrastructure damage by wildlife	1.68	0.85	1.18	0.47	-5.50	108.24	0.00
Culture adulteration	1.66	0.88	1.14	0.40	-5.60	105.02	0.00
Likert scale of concerns, 1=Not a concern, 2=Small concern, 3=Large concern, 4=Not sure. Mean scores computed from responses where 4 was recoded as missing. Communities involved in Tourism N=100, non-tourism communities N=400							

All the mean concern scores were higher in communities involved in tourism than non-tourism communities. Similarly, an Independent-Samples T Test comparison of perceived benefits by communities involved in tourism and those not involve in tourism and showed that nine out of 10 benefits were significantly different between the communities (Table 25). Generally, the mean benefit scores were higher in tourism communities than non-tourism communities indicating a greater perception of benefits.

Table 25: Comparison of benefits by tourism involvement

Benefits	Communities involved in tourism		non-tourism communities		t	df	Sig. (2-tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Increased conservation awareness	2.80	0.45	2.57	0.57	-4.25	186.07	0.00
Provision of ecosystem services	2.70	0.60	2.54	0.62	-2.36	152.46	0.02
Maintenance of cultural identity	2.63	0.56	1.99	0.73	-8.22	479.00	0.00
More business opportunities	2.62	0.70	1.66	0.85	11.59	179.69	0.00
Attracted people to live in the community	2.48	0.74	1.67	0.82	-9.48	161.45	0.00
Provision of religious/spiritual benefits	2.10	0.78	1.87	0.83	-2.54	144.12	0.01
Increased recreational activities	2.06	0.72	1.66	0.80	-4.75	160.76	0.00
Provision of bush-meat	1.97	0.82	1.63	0.64	-3.78	126.30	0.00
Improved infrastructure	1.62	0.68	1.62	0.82	-0.04	173.42	0.97
Increased conservation awareness	2.80	0.45	2.57	0.57	-4.25	186.07	0.00
Likert scale of benefits, 1=Not a benefit, 2=Small benefit, 3=Large benefit, 4=Not sure. Mean scores computed from responses where 4 was recoded as missing. Communities involved in Tourism N=100, non-tourism communities N=400							

The intrusion of tourists and culture adulteration are directly linked with tourism, and it is therefore not surprising that they were rated as greater concerns in communities involved in tourism than in those that are not. Tourists' intrusion appears to be increasing, partly due to the tourism products offered in these communities. Tourism products include a community tour which takes tourists through landmark houses including the chief's house, herbal medicine seller and other interesting places. The architecture of the houses is such that they give easy access to the pedestrian and some of the tourists find themselves in the houses of community members and even visit kitchens to interact with women cooking. Although the visitors find this exciting, it is a form of intrusion and explains why tourist intrusion was rated as greater concern in tourism communities. Ramukumba et al., (2011) suggest that tourist intrusion can lead to a loss of privacy and disruption.

Cultural change is both a present and anticipated future concern. In Larabanga, an almost exclusively Muslim community, people are concerned about the changing lifestyle of inhabitants as a result of the influence of tourists. As the communities seek to increase tourism, there is concern about unintended consequences such as prostitution, indecent dressing, alcoholism, smoking, stealing, begging, and absenteeism among pupils/students who choose to follow tourists. There is a large body of literature suggesting that tourism may have detrimental effects on the social and cultural fabric of local communities (Brandon, 1996; Carrier and Macleod, 2005). Sometimes, there is a tendency for communities, hoping to attract tourists, to package their culture in a way to suit tourists. If care is not taken, it can lead to cultural commodification and subsequent adulteration (Dearden, 1991). Culture commodification may lead to cultural change which may cause a local community to lose its cultural significance in which case cultural practices may no longer have any spiritual value and become a commodity to sell. Honey (1999) contends that, while in theory ecotourism is respectful of local cultures and customs, in practice it may contribute to the destruction or modification of the very culture and lifestyles it aims to protect. As a result of differences in value systems, tourists may share different cultures from that of the local people. Discontentment arises when tourists are not sensitive to local cultures and begin to behave in ways that are at variance with local practice. Similarly, lifestyles of tourists may not be acceptable to the local communities.

However, other concerns that are rated higher in the communities involved in tourism than non-tourism communities such as crop depredation, livestock attacks by wildlife, wildlife attacks on pets, wildlife attacks on humans, infrastructure damage by wildlife, disease transmission to livestock and pets, poaching by local communities, destruction of the environment through hunting, lack of pasture, and loss of farmlands are general concerns of the communities. These concerns are related more to the location of the communities than involvement in tourism. Larabanga (0.2km) and Mognori (0.3km) are not only close to the park boundary but also located very close to the park headquarters. Records from the park records shows that communities closer to the park headquarters suffer from wildlife related issues (MNP, 2011) as listed above.

A comparison of the perceived benefits of communities involved in tourism and non-tourism communities revealed differences in the perception of benefits. Generally,

the benefits were rated as greater in communities involved in tourism than non-tourism communities. Attracting people to live in the community, increased visitation and overnight stays, more business opportunities, improved infrastructure, and increased recreational activities are all related to tourism and may explain why they were rated as higher benefits in communities involved in tourism than non-tourism communities. This view is supported by literature which suggests that conservation and tourism are closely linked in the minds of local communities (Lepp, 2007) and tourism benefits stimulate community interest in resource conservation (Manyara and Jones, 2007). These may explain the high rating of benefits in communities involved in tourism.

3.4.3.5 Traditional affiliations

Traditional affiliations was the fourth predictor of attitude towards Mole (Figure 7). A one-way ANOVA comparison of concerns by communities' traditional affiliation (Table 26) showed significant differences amongst the traditional areas. The mean scores of the Gonja traditional area were generally higher than the other traditional areas except for the variable "disease transmission to livestock and pets" which was higher in the Wa traditional area.

Table 26: Comparison of concerns by traditional affiliation

Concerns	Overall mean	Mean scores by traditional area			Scheffe result (<i>p</i> value)			ANOVA Measures	
		Mamprusi	Wa	Gonja	Mamprusi - Wa	Mamprusi - Gonja	Wa - Gonja	F	Sig.
Loss of farm lands	2.74	2.28	2.54	2.87	0.01	0.00	0.00	47.32	0.00
Crop depredation	2.66	2.50	2.44	2.75	0.81	0.01	0.00	15.26	0.00
Livestock attacks by wildlife	2.33	1.86	1.76	2.56	0.74	0.00	0.00	54.93	0.00
Loss of access to perform rituals	2.29	2.24	1.66	2.48	0.00	0.06	0.00	56.35	0.00
Lack of access to NTFPs	2.22	2.02	1.87	2.35	0.39	0.00	0.00	25.75	0.00
Lack of pasture	2.19	2.32	1.46	2.38	0.00	0.88	0.00	56.02	0.00
Hunting destruction of the environment	2.16	1.80	1.74	2.33	0.88	0.00	0.00	37.05	0.00
Poaching by local communities	2.13	1.52	2.10	2.23	0.00	0.00	0.23	24.75	0.00
Decreased support for conservation	2.13	1.88	2.21	1.97	0.83	0.04	0.05	5.47	0.00
Living in fear because of wildlife	2.00	1.56	1.85	2.11	0.14	0.00	0.03	11.30	0.00
Disease transmission to humans	1.88	1.58	1.98	1.90	0.13	0.18	0.81	2.16	0.12
Disease transmission to livestock and pets	1.83	1.46	1.99	1.83	0.03	0.11	0.49	3.45	0.03
Attacks on humans by wildlife	1.80	1.36	1.47	1.95	0.74	0.00	0.00	21.23	0.00
Pets attacks by wildlife	1.79	1.52	1.60	1.88	0.88	0.03	0.03	6.06	0.00
Infrastructure damage by wildlife	1.47	1.34	1.25	1.55	0.84	0.30	0.01	4.94	0.01
Tourists intrusion	1.44	1.12	1.47	1.51	0.04	0.03	0.90	3.85	0.02
Culture adulteration	1.39	1.18	1.40	1.46	0.15	0.22	0.80	1.99	0.14

Likert scale: 1=Not a concern, 2=Small concern, 3=Large concern, 4=Not sure. Mean scores computed with 4 recoded as missing. Mamprusi N=50,Wa N=100,Gonja N=350, df with groups= 497

A one-way ANOVA comparison of benefits by communities' traditional affiliations (Table 27) showed that nine out of 10 benefits were significantly different between the traditional areas. The mean scores of the Gonja traditional area communities were generally higher than the other traditional areas indicating higher perception of benefits.

Table 27: Comparison of benefits by traditional affiliation

Benefits	Overall mean	Mean scores by traditional area			Scheffe result (p value)			ANOVA Measures	
		Mamprusi	Wa	Gonja	Mamprusi - Wa	Mamprusi - Gonja	Wa - Gonja	F	Sig.
Increased conservation awareness	2.62	2.26	2.62	2.67	0.00	0.00	0.68	12.78	0.00
Provision of ecosystem services	2.59	2.14	2.53	2.67	0.00	0.00	0.12	17.28	0.00
Maintenance of cultural identity	2.19	1.72	2.05	2.30	0.06	0.00	0.02	13.72	0.00
Provision of religious/spiritual benefits	2.04	1.56	1.62	2.22	0.93	0.00	0.00	25.22	0.00
Increased visitation and overnight stay	1.97	1.08	1.59	2.21	0.01	0.00	0.00	42.98	0.00
Attracted people to live in the community	1.92	1.04	1.38	2.20	0.07	0.00	0.00	67.29	0.00
More business opportunities	1.90	1.06	1.49	2.14	0.01	0.00	0.00	54.41	0.00
Increased recreational activities	1.89	1.22	1.55	2.09	0.11	0.00	0.00	28.82	0.00
Provision of bush-meat	1.76	1.64	1.71	1.79	0.87	0.45	0.67	1.04	0.35
Improved infrastructure	1.70	1.02	1.42	1.88	0.03	0.00	0.00	29.01	0.00
Likert scale: 1=Not a benefit, 2=Small benefit, 3=Large benefit, 4=Not sure. Mean scores computed with 4 recoded as missing. Mamprusi N=50, Wa N=100, Gonja N=350, df between groups = 2, df with groups = 497									

Generally, the concerns were rated higher in Gonja than in Mamprusi and Wa traditional areas. The higher concern in Gonja communities could be explained in terms of CREMA involvement, tourism involvement and community distance from the park.

Both the two CREMA communities (Jelinkon and Mognori) and tourism communities (Larabanga and Mognori) are Gonja communities. The majority of communities in close proximity to the park in the study: Kananto (0.1km), Larabanga (0.2km), Bawena (0.2km), Mognori (0.3km) and Jang (3.8km) are all Gonja communities. These may explain why the concerns were rated higher in the Gonja traditional area than in other traditional areas as discussed above.

However, disease transmission to livestock and pets was rated higher in the Wa traditional areas than in other traditional areas. Mole used to be a clearance zone for tsetse fly control program before the creation of the park (MNP, 2011). Although the insects are no longer wide spread in the area, they are found in some small areas of the park particularly associated with ungulates such as antelopes and buffalos. Communities closer to such areas may have issues with tsetse fly attacking their cattle and also sheep and goats. During the key informant interviews and focus groups meetings, some of these communities allege that wildlife transmit disease to their livestock. These may explain why disease transmission to livestock and pets was rated high in Wa traditional area.

Most of the benefits were rated higher in the Gonja traditional area than the Mamprusi and Wa traditional area except provision of bush-meat which was not statistically significant. The high rating of benefits in Gonja traditional area is due to the involvement of Gonja communalities in CREMA activities, tourism activities, and close proximity to the park. These activities and the location of the Gonja communities make them enjoy more benefits than the other communities in other traditional affiliations.

3.4.3.6 Demographic factors

According to the classification tree (Figure 7), demographic variables do not have a major influence on attitudes towards the park.

An Independent-Samples T Test comparison of perceived concerns by gender shows that only one concern: attacks on human by wildlife ($t=2.03$, $df=328.24$, $p<0.03$) was significantly different between males and females with a higher mean score in females than in males indicating a higher concern. Wildlife attacks on humans, although rare, sometimes do happen in these communities. The activities mainly done by females, such as fetching water from water bodies which may serve as a waterhole for wildlife and the

collection of NTFPs which may serve as food for wildlife, expose them to attacks by wildlife. There was one occasion when a hyena attacked a mentally retarded women who slept outside in one community, Kananto. This may explain why wildlife attacks on humans were rated as a greater concern among females than males.

Similarly, an Independent-Samples T Test comparison of perceived concerns by age showed that only one concern: living in fear because of wildlife ($t=2.09$, $df=498$, $p<0.04$) was significantly different between youth and adults with a higher mean score in youth than in adults indicating a higher concern. This may be due to the role of the youth in fetching water in rural communities. The water sources, which may also serve as waterhole for wildlife, expose them to attacks by wildlife. The demographic variables: gender and age did not show any statistically differences in the perception of benefits in the communities.

3.4.3.7 Perception of concerns and benefits by attitude groups

The responses for the overall attitude towards the park were put into two groups: a “positive group” and a “negative group” to assess whether these two groups differed in their perceptions of specific aspects of the park. The “somewhat positive” and “very positive” categories were put into the “positive group”, whereas the “somewhat negative” and “very negative” were put into the “negative group”. The two groups were then tested against perceived concerns and benefits.

An Independent-Samples T Test comparison of perceived concerns by attitude groups (Table 28) showed that 11 out of 17 concerns were significantly different between the positive and negative attitude groups. Seven of the concerns were perceived higher in the “negative attitude group” whereas four of the concerns were higher in the “positive attitude group.”

Table 28: Comparison of concerns by attitude groups

Concerns	Positive attitude group		Negative attitude group		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Loss of farm lands	2.74	0.50	2.76	0.50	-0.39	469.00	0.69
Crop depredation	2.60	0.55	2.83	0.45	-4.46	288.32	0.00
Livestock attacks by wildlife	2.32	0.79	2.38	0.84	-0.69	469.00	0.49
Hunting destruction of the environment	2.28	0.69	1.88	0.70	5.69	469.00	0.00
Loss of access to perform rituals	2.24	0.75	2.49	0.72	-3.37	469.00	0.00
Poaching by local communities	2.18	0.65	2.02	0.79	2.26	469.00	0.02
Lack of access to NTFPs	2.17	0.66	2.40	0.62	-3.41	469.00	0.00
Lack of pasture	2.16	0.81	2.27	0.86	-1.21	226.53	0.23
Decreased support for conservation	2.10	0.83	2.18	0.90	-0.90	222.98	0.37
Living in fear because of wildlife	1.91	0.84	2.25	0.85	-3.97	469.00	0.00
Disease transmission to livestock and pets	1.80	1.14	1.85	1.21	-0.39	469.00	0.70
Disease transmission to humans	1.77	1.08	2.04	1.18	-2.38	469.00	0.02
Attacks on humans by wildlife	1.72	0.85	2.01	0.88	-3.31	469.00	0.00
Pets attacks by wildlife	1.67	0.83	2.03	1.02	-3.60	201.59	0.00
Tourists intrusion	1.51	0.91	1.16	0.56	5.08	380.41	0.00
Infrastructure damage by wildlife	1.48	0.88	1.45	0.94	0.34	469.00	0.74
Culture adulteration	1.44	0.85	1.14	0.52	4.72	384.59	0.00
Likert scale of concerns, 1=Not a concern, 2=Small concern, 3=Large concern, 4=Not sure. Mean scores computed from responses where 4 was recoded as missing. Positive attitude group N=339, Negative attitude group N=132							

Similarly, an Independent-Samples T Test comparison of perceived benefits by attitude groups (Table 29) showed that nine out of 10 benefits were significantly different

between the positive and negative attitude groups. Generally, the mean benefit scores were higher in the “positive attitude group” than in the “negative attitude group.”

Table 29: Comparison of benefits by attitude groups

Benefits	Positive attitude group		Negative attitude group		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Increased conservation awareness	2.66	0.52	2.50	0.61	2.62	209.51	0.01
Provision of ecosystem services	2.57	0.61	2.67	0.60	-1.52	243.10	0.13
Maintenance of cultural identity	2.29	0.75	1.98	0.87	3.91	469.00	0.00
Provision of religious/spiritual benefits	2.20	0.87	1.61	0.91	6.56	469.00	0.00
Attracted people to live in the community	2.16	0.88	1.39	0.83	8.64	469.00	0.00
Increased visitation and overnight stay	2.15	0.96	1.45	0.88	7.56	260.08	0.00
More business opportunities	2.10	0.88	1.40	0.70	9.07	300.15	0.00
Increased recreational activities	2.03	0.96	1.54	0.82	5.52	276.05	0.00
Improved infrastructure	1.85	0.91	1.31	0.67	7.06	324.66	0.00
Provision of bush-meat	1.81	0.78	1.58	0.74	2.90	469.00	0.00
Likert scale of benefits, 1=Not a benefit, 2=Small benefit, 3=Large benefit, 4=Not sure. Mean scores computed from responses where 4 was recoded as missing. Positive attitude group N=339, Negative attitude group N=132							

According to social exchange theory, it is expected that people with a positive attitude will perceive benefits and concerns differently than people with a negative attitude to the park. Generally, the concerns were rated higher in the negative group, except poaching by local communities, destruction of the environment through hunting, culture adulteration by tourist and tourists intruding into the private lives of people. Poaching and the destruction of the environment through hunting may be carried out by only a small segment of the population. Yet the entire community bears the consequences

such as being branded as a poaching community. People involved in group hunting may set fires to flush out wildlife. This activity sometimes gets out of hand, resulting in wild fires that destroy vast areas of arable land and farms. The high rating of “Culture adulteration by tourists” and “tourists intruding into the private lives of people” by the positive group may be due to tourism activities in communities involved in tourism. Although, tourism is desirable because of the money it brings into the local economy, its unintended consequences such as disrespect for local cultures, and intrusion into private lives are undesirable. These reasons may explain why the four concerns were rated higher in the positive group than in the negative group.

People with a positive attitude are expected to perceive benefits more strongly than those with a negative attitude and this relationship was supported in the study. Generally, the benefits were rated higher in the positive group than the negative group except for the provision of ecosystem services which showed no statistically significant differences. In summary, it appears that benefits are more relevant in shaping overall attitudes compared to concerns.

3.5 Conclusions

This section summarizes the key findings in order to draw conclusions. The key findings of the study are as follows:

1. Overall, most people have a positive attitude towards the park. Yet, their responses to specific concerns and benefits show mixed perceptions of the park. More than half of the respondents think that the cost of living near the park outweighs the benefits.
2. Loss of farmlands, lack of access to NTFPs and crop depredation are the top three concerns of living near Mole National Park. Similarly, increased conservation awareness, the provision of ecosystem services, and the maintenance of cultural identity are the top three benefits.
3. The strongest predictor of attitude towards the park is the community involvement in a CREMA, followed by distance from the park, tourism involvement, traditional area, gender, and then age.

4. CREMA communities rated all the benefits higher than non-CREMA communities although they still had concerns
5. Communities closer to the park rated perceived concerns higher than communities farther away from the park. Some of the communities closer to the park are within the zone of influence and suffer the brunt of the negative consequence of conservation such as loss of farmlands, crop depredation and attacks on livestock. Nevertheless, communities closer to the park also perceive benefits higher than those farther away from the park.
6. Communities involved in tourism perceive concerns as greater than those which are not. Tourist intrusion and cultural adulteration were perceived as larger concerns in only tourism communities. However, tourism communities are appreciative of their location and perceive benefits higher than non-tourism communities.
7. Traditional area affiliation also influences attitude towards the park. Communities belonging to the Gonja traditional area, which includes communities involved in CREMA and tourism, activities, rated benefits higher than communities in Wa and Mamprusi traditional areas.
8. Demographic variables are not a significant influence people's perception of the concerns and benefits. Gender is the strongest factor followed by age.
9. Attitudes towards Mole National Park are related to how people perceive the benefits and concerns. Positive attitudes are shaped by higher perceived benefits and lower perceived concerns.

In conclusion, the perception of the concerns and benefits of living near PAs like national parks affects the way adjacent communities approach conservation. According to social exchange theory, understanding the exchange of resources (concerns and benefits) among individuals and groups (PAs and adjacent communities) in an interactive situation helps create an environment that will allow local communities to support conservation.

The study shows that park adjacent communities have an overall positive attitude towards the park. However, their response to specific concerns and benefits showed a mixed perception about the park. It is imperative for PAs to find congruence in serving both conservation and development outcomes. CBNRM could be of help in this direction.

CREMAs, a variant of CBNRM in Ghana, enable PA-adjacent communities to see the benefits and tolerate them higher than the concerns. Participation by major stakeholders, particularly local communities, should be the way forward in PA management as has been recognised for almost 30 years (McNeely and Miller, 1985). There is global agreements to expand the areas set aside as PAs (CBD, 2011). As this expansion occurs, increasing numbers of communities will become “PA-adjacent” leading to an even greater need to understand the costs and benefits of PAs to local communities.

Although this study did not measure economic impact, communities closer to the park particularly tourism communities were better off than other communities judging from their attractiveness. Communities closer to the park although had many concerns, rated benefits higher than communities farther away from the park. This corroborates the findings by Wittemyer et al., (2008) that communities on the edges of PAs draw people because of the benefits they enjoy. The benefits they enjoy have implications for poverty reduction. This may explain why in spite of the challenges of living near PAs, park-adjacent communities are still an attractive place for people to live. The thriving population is an indication of the improvement of the wellbeing of the park-adjacent communities.

Communities involved in tourism perceive benefits to a greater extent than those that are not, and are very appreciative of their strategic location. Tourism in PAs offers significant opportunities to local communities in the developing world as a useful tool to reduce poverty (Brockelman and Dearden, 1990; Chok et al., 2007). This study corroborates these findings; however, tourism needs to be managed properly to minimize unintended consequences such as tourist intrusion and cultural adulteration. Also, there should be a concerted effort to minimize leakage of tourism revenues so that more money stays in the local economy. Economic leakage represents a reduction, or possible elimination, of the economic benefits local communities would receive if money was spent either in or around PAs (Wells, 1992). If properly managed, tourism has huge potential for poverty reduction in park adjacent communities as shown by the attractiveness of tourism communities in this study.

The success of national parks as a conservation strategy depends to some extent on the support of the nearby communities. Adjacent community perception of concerns and benefits is important in the conservation process. People with negative attitudes perceive concerns higher than those with positive attitudes whereas people with positive attitudes perceive benefits higher than those with negative attitudes. The study provides support for social exchange theory. It seems that when people get benefits they are more willing to put up with concerns. For example, communities closer to the park had a number of concerns but are putting up with the concerns because of the benefits they derive from the park and wildlife related tourism. Therefore, efforts should be made to ensure that concerns do not outweigh the benefits of living near parks to ensure support for conservation.

Chapter 4: The Impacts of Wildlife on Park-Adjacent Communities in Northern Ghana

4.0 Abstract

Human-wildlife interactions have consequences for both wildlife and human populations. Mole National Park (MNP), arguably the premier park in Ghana, attracts many tourists seeking to observe charismatic wildlife such as elephants. However, many of the species that are attractive to tourists who visit the park can create problems for adjacent communities. This paper assesses the impacts of wildlife on communities near MNP. The impacts were studied in ten communities surrounding the park using key informants, focus groups and household surveys.

The majority of people surveyed had positive attitude towards wildlife in general. However, their overall response to specific species show a mixed results. Hyenas, patas monkeys, and partridges are the top three species that impact negatively on the communities. However, some species such as kobs, waterbucks and leopards are viewed more positively. Several factors help explain differences in a community's attitude towards wildlife. The most important predictor of attitude towards wildlife is Community Resource Management Area (CREMA) involvement, followed by community distance from the park, the traditional area affiliation, and respondent age groups. CREMA communities are more tolerant of wildlife and have more positive attitude towards wildlife than non-CREMA communities. Cultural valuation of wildlife influences how communities interact with wildlife. Taboo species are tolerated, although the same species may be considered problematic by other communities.

Survey results inform recommendations for future practice. Park ranger patrols, protecting water bodies, and keeping livestock in pens are the top three measures to enhance or mitigate human-wildlife interactions. Park-adjacent communities should practice semi-intensive livestock rearing and cultivate crops that do not attract wildlife. Park management needs to intensify interventions to minimize the effect of crop depredation which raises food security concerns and affects rural livelihoods.

Keywords: Wildlife, impacts, adjacent communities, Mole National Park, livelihoods

4.1 Introduction

Humans have interacted with wildlife for millennia with consequences for both wildlife and human populations. People have different perceptions about wildlife and this affects the way people interact with or perceive the impact of wildlife interactions. The challenges of increasing social conflict over wildlife issues are born from ideology and human perspective on wildlife (Teel and Manfredi (2010). Humans have greatly modified habitats that are essential for the survival of many wild species (Mortelliti et al., 2010). Human interactions with wildlife are a growing concern globally in all areas where wildlife and human populations share natural resources (Woodroffe et al., 2005). The purpose of this paper is to assess human-wildlife interactions in communities adjacent to Mole National Park, Ghana.

Protected Areas (PAs) are a key mechanism for biodiversity conservation (Dudley, 2008). Large mammal populations are best conserved in landscapes where large PAs such as national parks are surrounded by buffer zones, connected by corridors, and integrated into a greater ecosystem (Nyhus and Tilson, 2004). Multi-use buffer zones, including those containing complex agroforestry systems, may provide both economic benefits to people and conservation benefits to wildlife. However, this situation often promotes increased conflict between humans and wildlife, especially for communities adjacent to PAs. Crop damage caused by raiding wildlife is a prevalent form of human-wildlife conflict along protected area boundaries in the tropics (Naughton-Treves, 1998; Monney et al., 2010).

Human-elephant conflict is one of the leading human-wildlife conflicts in tropical PAs (Linkie et al., 2007; Hedges and Gunaryadi, 2010; Nyirenda et al., 2011). Apart from elephants, wildlife such as primates, particularly baboons and monkeys, are a nuisance to communities adjacent to PAs. Baboons and other primates cause damage to crops: their cooperative behaviours, opportunistic life-style, non-specialized and omnivorous dietary tendencies, and their ability to learn very rapidly and change their behaviour accordingly, make them very successful and potentially troublesome when living close to humans (Twehoyo et al., 2005; Hockings, 2009; Warren et al., 2011).

Attacks on livestock are another impact of wildlife on adjacent communities. There are reports of livestock depredation by lions, leopards, cheetahs and spotted hyenas resulting in retributive killings of these species by farmers in livestock producing areas in Kenya (Ogada et al., 2003; Patterson et al., 2004) and in northern Tanzania (Kissui, 2008).

Community distance from the park boundary may affect the impact that wildlife exert on communities. The proximity of farms to PAs and the presence or absence of neighbouring farms affect the likelihood of any farm sustaining crop damage from baboons (Hill, 2000). Generally, proximity of farms to the boundary line has been the strongest predictor of crop raiding by elephants (Naughton-Treves, 1998; Sam et al., 2005). However, Oppong et al. (2008) argue that the size of farms may also be important in elephant crop raids, irrespective of the distance.

Disease transmission to humans, livestock and pets is another possible impact of wildlife on park-adjacent communities. Wild birds are important to public health because they can be infected by a number of pathogenic microorganisms that are transmissible to humans (Reed et al., 2003). Many of the major human infectious diseases are similar or identical to diseases of other wild primate populations (Wolfe et al., 2007) and diseases could be transmitted from wildlife to livestock and vice versa and then to humans.

Not all impacts are negative. Park-adjacent communities potentially benefit through mechanisms such as the provision of bush-meat, ecosystem services, the enhancement of cultural and religious-spiritual values, and tourism. Local communities around tropical PAs are mainly subsistence farmers who depend on the land for their livelihood. Hunting for bush-meat is a major component of rural livelihood strategies in the tropical forest zone of West and Central Africa (Kümpel, 2010). Bush-meat hunting encourages the immigration of people to villages close to national parks and game reserves (Nfunda and Roskaft, 2010). Bush-meat hunting is driven by economic need, cultural affiliation and other cultural and religious/spiritual connections.

Other ecosystem services related to wildlife conservation impact positively on park-adjacent communities. This includes: provisioning services like food and water,

regulation of floods, droughts and land degradation, and supporting services such as soil formation, and nutrient cycling (Millennium Ecosystem Assessment, 2005). These ecosystem services provide inducements to live near PAs.

The enhancement of cultural and religious/spiritual values is an important impact of wildlife on park-adjacent communities. The cultural and religious/spiritual values of wildlife are manifest in worldviews, taboos, festivals, sacred groves and totems. Taboo animals are not harmed or killed for various reasons. Traditions dictate that these animals are sacred and hold the spirits of ancestors. As such, they are revered and protected. Sacred animals exert such a positive impact on local people that such animals are tolerated even when they create problems. For example, in Boabeng-Fiema Monkey Sanctuary in Ghana, a sacred grove that protects two monkey species (the Black and White Colobus and the Mona monkey), community members tolerate the monkeys eating their food. The people regard the monkeys as the embodiment of the spirits of their ancestors (Sammy, 2010) and thus monkeys eating their food is seen as visitation by the ancestors. Animals are used in folktales to tell about the denizens of the forest who represent human beings. Certain animals became symbolic of certain qualities. For example, the tortoise represent the medicine man, the philosopher, and the patient man (Appiah, 1979). Animals are also used in proverbs to appraise human nature. For example, the expressions “Monkey take,” and monkey takes, “monkey give me,” monkey refuses” are a warning against becoming a mean or greedy person. Another expression, “the monkey can't come from the bush and sneeze like a man” suggest that a servant cannot be above his master. Finally, the proverbs “The tall tree enabled the baboon to see what was going on in the forest” teaches that you need friends to help you on your way in life (Appiah, 1979).

The traditional areas around Mole National Park (MNP) each have their own culture, values, beliefs, taboos, totems, festivals and practices which form interactions with wildlife. These particularities give rise to different perceptions of the impact of wildlife. For instance, the use of totemic animals within various ethnic groups is protected by traditional laws with religious/spiritual underpinnings. Totems are used as symbols for group identity and the adoption of wildlife as totems underscores the

importance of wildlife to people. According to Conservation International (2005), totemism is inextricably interwoven with the socio-cultural life of many cultures in the world, and there are more than 200 totemic species in Ghana.

Tourism is yet another impact of wildlife on local communities. Park tourism impacts positively in adjacent communities when local communities are involved in the supply of tourism products and services. There is a growing market in park tourism and other forms of PA tourism (Eagles, 2001), with wildlife as a major motivation for people to visit national parks (Akama and Keiti, 2003; Lindsey et al., 2007). Tourism in and around PAs could be a tool for conservation, offer opportunities, and contribute to the quality of life for the local communities (Brockelman and Dearden, 1990; Bushell and Eagles, 2007; Scheyvens and Momsen, 2008).

Protected area governance also influences the way that local communities perceive wildlife impacts. Community-based Natural Resource Management (CBNRM) is a form of governance with the potential to help local communities embrace conservation (Koch, 2004). CBNRM is both a conservation and rural development strategy tool, involving community mobilisation and organisation, institutional development, comprehensive training, enterprise development, and monitoring of the natural resources base (IUCN, 2005). CBNRM allows local stakeholders to participate actively in the sustainable utilization and control of their natural resource. This is important because community members who actually live in, and depend on, a given ecological niche have an interest in conserving that resource (Ukaga and Maser, 2004). In Ghana, Community Resource Management Areas (CREMAs) are a manifestation of CBNRM. A CREMA is “*any geographically defined area outside a protected area which is endowed with sufficient natural resources, and where communities have organised themselves for the purpose of sustainable resource management*” (GWD, 2004; MNP, 2005). MNP attracts many tourists seeking to observe charismatic wildlife such as elephants. However, many of the species that are attractive to tourists that visit the park can create problems for adjacent communities with implications for sustaining rural livelihoods and exacerbating poverty. This paper examines the impacts of wildlife on communities around MNP and addresses the following research questions:

1. What is the overall attitude of the adjacent communities towards wildlife?
2. Are the differences in attitude related to the perceived impacts of different wildlife species?
3. What are the perceived impacts of different species?
4. What are the factors that explain these differences in the communities?
5. What are the most effective mitigation strategies for human-wildlife conflict around MNP?

4.2 The Study Area

Mole National Park is Ghana's largest PA and covers about 4,577 km² (Figure 8). It lies between 9° 11' and 10° 10' N, and between 1° 22' and 2° 13' W (MNP, 2011). It was gazetted as a national a park in 1971 for its outstanding wildlife and also to protect representative ecological habitats.

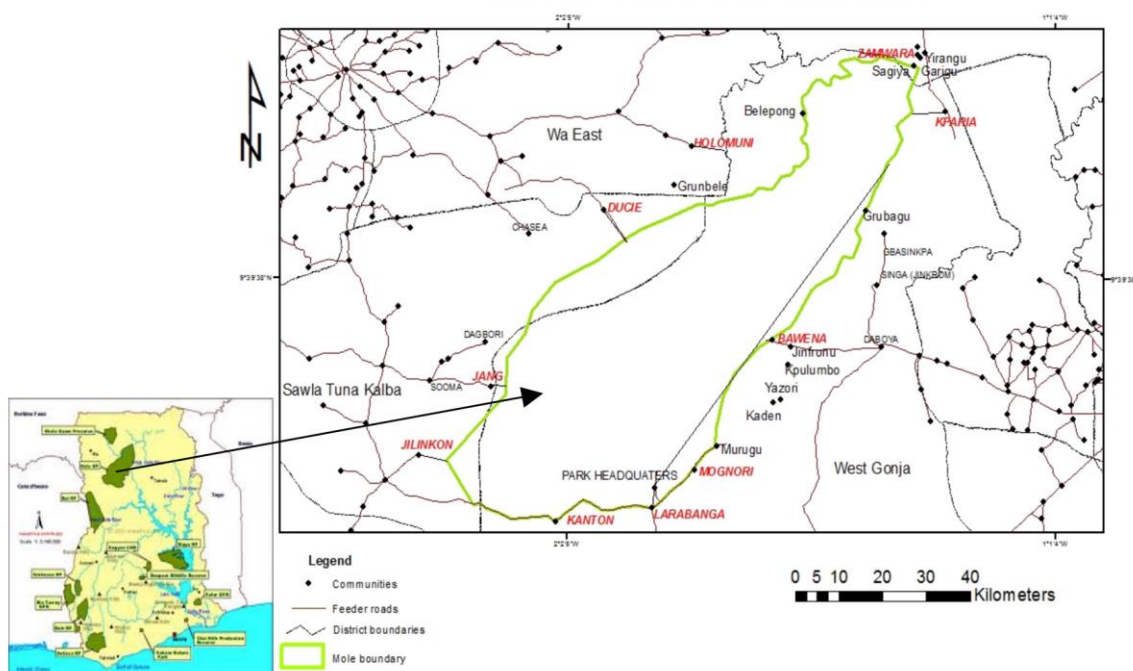


Figure 8: Map of Mole National Park showing the adjacent communities

There are 33 communities surrounding the park. Some of these communities have community resource management areas (CREMA). Ten communities were selected for the study based on the number of communities in a traditional area, proximity to the park, and CREMA or non-CREMA status (Table 30). A detailed description of the park and the communities around it is provided in chapter three of the thesis.

Table 30: The list of communities selected for the study

Community	Traditional Area	Non-CREMA (No) CREMA (Yes)	Distance from the park (km)	Coordinate(W)	Coordinate (N)
Kananto	Gonja	No	0.1	2°3'33.546"	9°11'36.599"
Larabanga	Gonja	No	0.2	1°51'39.924"	9°13'16.121"
Bawena	Gonja	No	0.2	1°36'38.067"	9°32'49.487"
Mognori	Gonja	Yes	0.3	1°46'13.009"	9°17'43.702"
Zanwara	Mamprusi	No	2.6	1°18'31.521"	10°5'49.523"
Jang	Gonja	No	3.8	2°11'41.366"	9°27'18.661"
Jelinkon	Gonja	Yes	6.9	2°20'49.985"	9°19'15.15"
Holomuni	Wa	No	7.9	1°46'44.432"	9°55'8.947"
Kparia	Gonja	No	8.0	1°14'54.492"	9°59'12.688"
Ducie	Wa	No	8.5	1°57'45.961"	9°47'51.209"

4.3 Methods

Mixed methods of key informant interviews, focus group meetings, and surveys were used in order to provide rich data and triangulation through converging lines of inquiry (Yin, 2009).

4.3.1 Key informants

Key informants were used to collect primary information from knowledge holders such as chiefs, elders, and members of Protected Area Management Advisory Units (PAMAUs) of the park as well as park staff, Non-Governmental Organizations (NGOs), district assembly officials, and representatives from identifiable groups in the communities like bee keepers. The information gathered was related to human-wildlife issues such as cultural valuation of wildlife, the impacts of wildlife and how they vary in different communities, and how the impacts can be mitigated. At least two key informants' interviews were conducted in each of the ten adjacent communities, culminating to a total of 21 key informant interviews. The interviews were conducted using a semi-structured interview guide and lasted between 45-90 minutes. Information gathered from the key informants was followed up in focus group meetings.

4.3.2 Focus groups

Focused group meetings were used to discuss the issues raised by the key informants such as cultural valuation of wildlife, the impacts of wildlife and how they vary in different communities, and how the impacts can be mitigated. The participants for focus group meetings were recruited from traditional leaders, women's groups, youth groups, hunters, farmers, livestock keepers and bee keepers. Recruitment was conducted by making initial contact with key individuals in the communities and then word of mouth was used to identify others. There were at least 6-8 participants in each group however, some of the groups attracted more people as the meeting continued. The discussions were facilitated using a semi-structured interview guide. Interviews lasted for about 2-3 hours. At least one focus group meeting was held in each of the ten adjacent communities, culminating in 11 focus group meetings. The information gathered from the key informants and the focus groups was used to refine the questionnaire used in the household survey and also to discuss the findings of the study.

4.3.3 Household surveys

Household surveys (Appendix G) were used to sample the views of the broader community on human-wildlife issues such as cultural valuation of wildlife, the impacts of wildlife and how they vary in different communities, and how the impacts can be mitigated. The questionnaires were mainly closed-ended questions and were divided into five sections: wildlife impact, concerns and benefits, strategies to enhance and mitigate human-wildlife interactions, the community's perceptions of tourism, and a demographics section. The questionnaire was piloted in two communities and further refined before the actual survey.

Three research supervisors/assistants, one from each of the three traditional areas were recruited and trained to help with the field research. An additional twenty research assistants (two teachers from each community) were recruited to cater for the different languages in the ten communities and trained to conduct the survey. The teachers were natives of the local communities. As part of the training, the research assistants were asked to answer the questionnaires themselves and this was followed up by a debriefing with the principal researcher. In total the research team consisted of 24 people: the principal researcher, three research supervisors, and 20 research assistants (two school

teachers in each community). The research supervisors and research assistants were trained by the principal researcher. In addition, daily debriefing was conducted to ensure quality control during the administration of the survey questionnaires.

In each community the respondents were selected by first stratifying the community according to the settlement patterns which was along the major language groups. In each stratum, the household were randomly selected by picking household numbers written on a piece of paper from a hat and the respondents selected from age cohorts and gender. The research assistants (two teachers) from each community were supervised to conduct the surveys. The research assistants read the questionnaire to the respondents and filled out the resulting answers which lasted for about 30 to 60 minutes. There were daily debriefing to resolve outstanding issues before the next day. Fifty questionnaires were completed in each of the ten communities culminating in 500 surveys. In some communities more than 50 people were approached before the 50 per community target was reached. However, generally the community participation was high due to the proper entry protocols observed and the involvement of local residents as research assistants.

In each community, the chief's palace was visited first, gifts presented and the research mission explained. A message was then sent by the chief to the whole community about the study. As a result of this proper community entry protocol over 90% of participants approached completed the questionnaire. A response rate of 60% is considered sufficient in accurately representing population being sampled (Dolsen and Machlis, 1991) whereas 70% is considered very good (Babbie, 2012). The over 90% response rate is therefore adequate representation of the communities.

The key informant interviews, focus groups, and field observation started in November, 2011 but training of research assistants and the survey was conducted from January, 2012 to November, 2012. Questions from Q2, Q3, Q13, Q15, Q16, Q19, Q22, and Q23 of Appendix G were used for this chapter. The data-set collected was coded and analyzed using IBM SPSS version 21 and Office 2013 Microsoft Excel.

4.4 Results and Discussion

Understanding the impact that wildlife have on park-adjacent communities and the perceptions of specific wildlife species can enhance the management of human-wildlife issues. This section will outline the main results and discuss their implications.

4.4.1 Overall attitude towards wildlife

Respondents were asked to rate their overall attitude towards wildlife on a five-point Likert Scale (Figure 9).

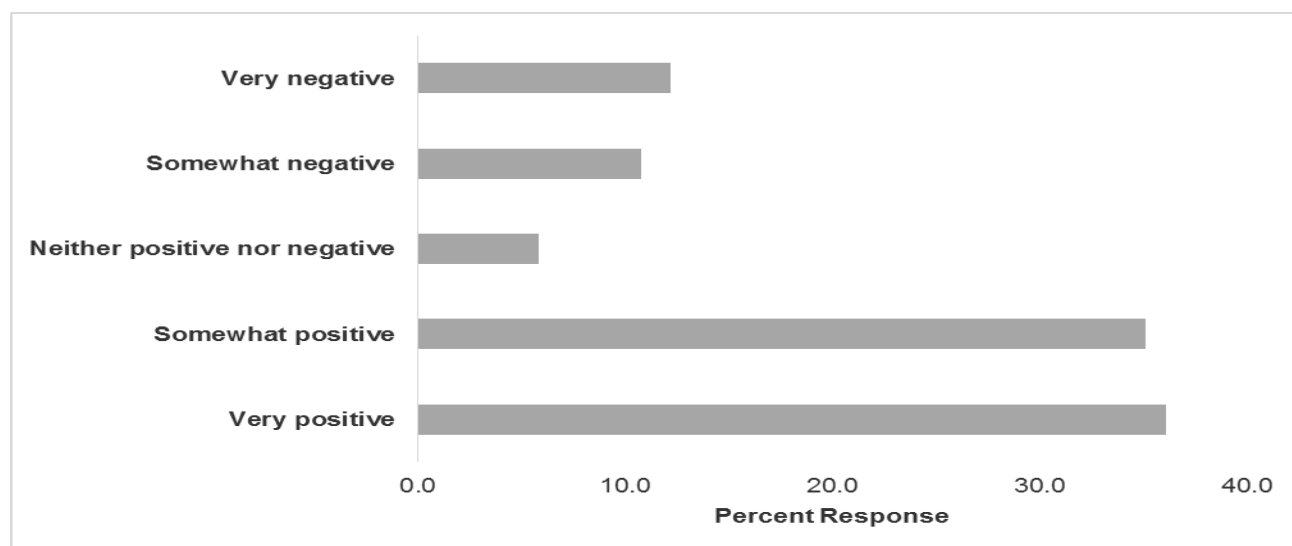


Figure 9: Overall attitude of adjacent community members towards wildlife

Overall attitude towards wildlife fell mainly within the very positive (36.1%) and somewhat positive (35.1%) categories cumulating in 71.2% of the responses. Only 5.8% of the respondents had no opinion about wildlife and a small percentage of people had negative views (10.8% somewhat negative and 12.2% very negative). A majority of people have a positive attitude towards wildlife in general. This shows that the people are not necessarily against wildlife or conservation, but may show a dislike for specific species based on their perception of them. This difference in species perceptions is explored in the next section.

4.4.2 Relationship between attitude and perceived impact of different wildlife species

The attitude towards wildlife can be further understood by a species specific analysis. Respondents were asked to rate how specific wildlife species affected their experience of living near the park (Q2 of Appendix G) on a five-point Likert Scale with a score of 1 corresponding to “strongly detracted,” and 5 to “strongly enhanced.” The responses in Table 31 are ranked according to overall strength of detraction

Table 31: Perceived impact of wildlife species

Wildlife	Percentage of responses						Mean	Std. Dev.
	1	2	3	4	5	1+2		
Hyenas	91.4	4.0	2.4	1.0	1.2	95.4	1.17	0.63
Patas monkeys	81.4	10.6	0.4	3.0	4.6	92.0	1.39	0.99
Partridges	65.8	27.2	2.4	1.4	3.2	93.0	1.49	0.88
Rats	63.6	29.6	1.2	2.6	3.0	93.2	1.52	0.89
Insects	63.8	28.8	0.8	4.6	2.0	92.6	1.52	0.88
Parrots	78.8	5.0	1.2	11.2	3.8	83.8	1.56	1.18
Scorpions	57.6	34.2	3.6	3.4	1.2	91.8	1.56	0.82
Snakes	62.8	26.8	3.2	5.0	2.2	89.6	1.57	0.94
Grass-cutters	59.4	32.2	6.0	2.4	5.4	91.6	1.62	1.02
Elephants	56.6	27.8	5.4	5.6	4.6	84.4	1.74	1.09
Warthogs	49.6	33.0	4.4	6.8	6.2	82.6	1.87	1.16
Other rodents	30.8	55.0	5.6	5.4	3.2	85.8	1.95	0.93
Baboons	38.6	43.4	6.0	6.2	5.8	82.0	1.97	1.10
Bushbuck	33.0	46.0	4.4	10.2	6.4	79.0	2.11	1.16
Vervet monkeys	29.0	48.6	5.2	11.6	5.6	77.6	2.16	1.13
Other birds	23.0	53.6	6.6	11.6	5.2	76.6	2.22	1.09
Leopards	25.8	40.2	8.2	19.4	6.4	66.0	2.40	1.24
Waterbucks	10.8	51.6	6.4	20.0	11.2	62.4	2.69	1.23
Kobs	7.2	48.6	7.6	25.4	11.2	55.8	2.85	1.21
Likert Scale: 1=Strongly detracted, 2=Somewhat detracted, 3=Not sure, Somewhat enhanced, 5=Strongly enhanced, N=500								

Overall response to the specific species shows more of detraction than enhancement. Hyenas, patas monkeys, partridges, insects, and rats are the species that impact most negatively on the people. The negative view about hyenas is as a result of their attacks on livestock and also of being a taboo animal in almost all the communities. Hyenas are noted for their attacks on livestock (Ogada et al., 2003; Patterson et al., 2004). In these communities, possession of livestock such as cattle, sheep, goats and fowls is a symbol of wealth. The livestock also serves as insurance in the event of crop failures. Attacks on livestock by wildlife are resented by the community resulting in the negative view about the hyenas. In addition, hyenas, unlike other taboo animals, are not revered in northern Ghana. They are rather associated with bad omens. Occasionally, although very rare, wildlife may attack humans. In 2010, a hyena attacked a mentally retarded women in Kananto, one of the villages near Mole. This was less than a year before the data collection for this study begun. The news about the attack is well known in other adjacent communities, and this may have contributed the negative views about hyenas.

Patas monkeys have large home ranges, between 23km² (Chism and Rowell, 1988; Isbell and Chism, 2008) to 80km² in size (Hall, 1966) and are widely dispersed in open savannah habitats and agricultural lands (Engeman, 2010). Their diet includes African locust bean (*Parkia biglobosa*), a multi-purpose tree with great economic value (Hopkins, 1983; Hall et al., 1997), and maize, a staple food in northern Ghana. Their feeding habits and wide distribution makes them a nuisance to the communities.

Stone partridges are widespread and common in the Mole area and usually have a very large habitat range. They are very important agricultural pests in northern Ghana and feed on seeds and seedlings. They also dig holes around tubers and expose them to the scorching sun. The Mole area is well noted for growing peanuts and tubers, particularly yam. Farmers also grow cereals such as maize, millet, sorghum, and guinea corn. The large range of stone partridges makes them a problem for communities around Mole. The literature also support this finding that partridges feed on planted seeds, seedlings, and tubers (Rao et al., 2002).

Rats are common and widespread in the Mole area (Appendix H). They are important agricultural pests that feed on both crops in the field and also destroy stored

food crops such as grains and cereals. They are a source of concern for the adjacent communities where peanut and other grains are grown. Rats also cut grass and destroy rice and others cereals. The literature support the assertion of rats as agricultural pests in many parts of the world (Wood and Fee, 2003; Brown et al., 2008)

Insects such as sandflies are a nuisance to some of the communities. They appear early in the morning and can easily enter people's eyes and also bite. Some portions of Mole previously were a tsetse fly control clearance area before the creation of the park (MNP, 2011). A small population of tsetse flies is still present in some portions of the park. Although they are associated with large ungulates such as buffalos and antelopes they also bite humans. Communities closer to such areas where tsetse flies are present are exposed to bites from the insects. There are other tropical insects such as mosquitos, houseflies, and agricultural insect pests that disturb crops and villagers and account for why insects were rated high in detracting from the experience of community members.

However, some species such as kobs, waterbucks, and leopards are viewed less negatively by the people. This is due to the traditional and cultural values attached to these animals. Chiefs in northern Ghana sit on animal skins. The animals symbolize their traditional authority and therefore are revered. The paramount chief of the Gonja traditional area, Yagbonwura, sits on the skin of the kob (Conservation International, 2005). It is believed that the skin of a wild cat such as lion or leopard underneath the skin on which a chief sits makes him powerful. This may explain why a lion's skin forms part of the regalia when Yagbonwura sits in state (Conservation International, 2005). The leopard also has cultural significance. For example, the sword that the Asantehene holds when being sworn into office named the "*Mponponsuo*," means "responsibility" and has both hilt and blade encased in a sheath of leopard skin decorated with gold. The leopard stands for power and bravery and the gold for wealth (Appiah, 1979). The leopard is also known among some groups in Ghana to portray wisdom and some have it as their totem. For example, the Paramount Chief of the Akyem Abuakwa in the Eastern Region uses it as their crest or symbol. Traditional medical practitioners also believe that the skin of the leopard is an antidote to bad omens and use it as a talisman. The cultural valuation of these species as either totems or taboos account for the differences in the positive or

negative assessment of the species describe above. Although the traditional and cultural values of these species create a positive impact on the people, the demand for their skin and other parts threatens the survival of the species.

The above discussion suggests that although some wildlife create negative impacts on the people, wildlife still has a lot of cultural relevance for them. This dilemma is effectively summed up in a remark by one respondent: *“We want our children to see wildlife but park wildlife disturbs us a lot.”*

4.4.3 Classification tree

Recursive Partitioning (rpart): a decision support software using classification tree was used to determine the strongest predictor of attitude towards wildlife (Figure 10).

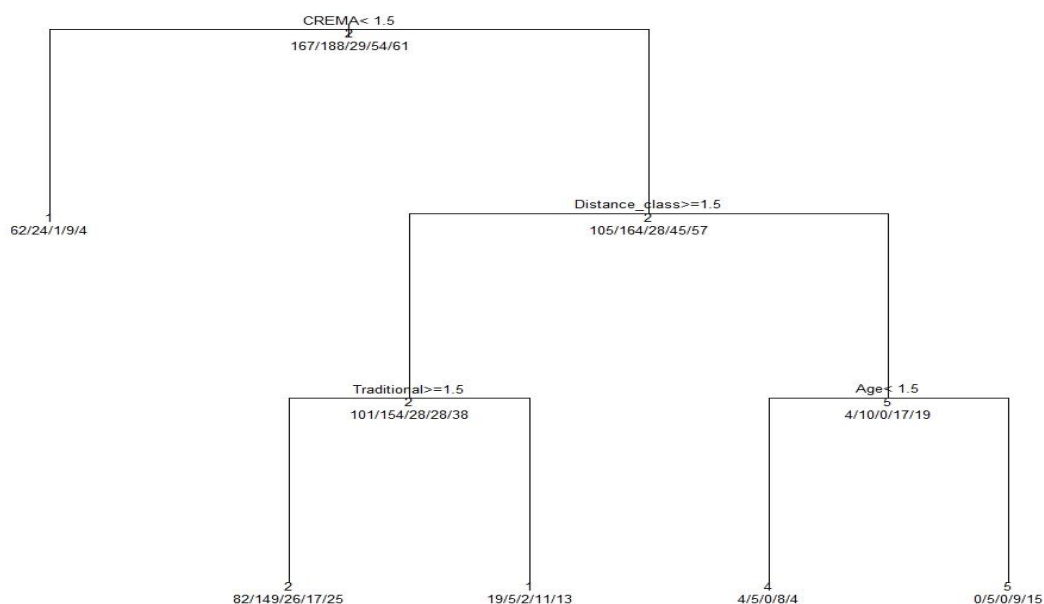


Figure 10: Classification tree showing factors that predict attitude towards wildlife

Classification trees use algorithms to predict membership of cases/objects in the classes of a categorical dependent variable from their measurements on one or more predictor variable (Breiman et al., 1984). In this study, the categorical dependent variable was attitude towards wildlife (Q16 of Appendix G) and the predictor variables were CREMA involvement, community distance from the park, community traditional areas, respondent age groups and gender. The tree is built through binary recursive partitioning. The partitioning continues until splitting and stops at the terminal nodes. The numbers at the end of each binary split represent the frequency of responses to each Likert Scale

from 1 to 5. For example, at the first split CREMA, 167 persons selected 1 “very positive,” 188 selected 2 “somewhat positive,” 29 selected 3 “neither positive nor negative,” 54 selected 4 “somewhat negative,” and 61 selected 5 “very negative.” From the classification tree, CREMA involvement is the most important predictor of attitude towards wildlife, followed by distance from the park, traditional area, and age groups.

4.4.4 Factors explaining attitude towards wildlife

The five main predictors of overall attitude towards wildlife: CREMA involvement, community distance from the park, community traditional areas, respondent age groups, and gender were tested to see if they explain the variability of perceived species impact amongst the communities and respondents.

4.4.4.1 CREMA involvement

Respondents were asked to rank their overall attitude towards wildlife (Q16 of Appendix G) from very positive to very negative. This responses were compared between CREMA and non-CREMA communities (Table 32).

Table 32: Comparison of overall attitude towards wildlife CREMA involvement

Attitude	Percentage of responses					
	Very positive	Somewhat positive	Neither positive nor negative	Somewhat negative	Very negative	(very +somewhat) positive
CREMA	61.0	23.0	2.0	9.0	5.0	84.0
non-CREMA	36.1	35.1	5.8	10.8	12.2	71.2
Chi-Square=35.59, df=4, Sig.=0.00, CREMA N=100, non-CREMA N=400						

A Cross tabulation comparison of overall attitude towards wildlife by CREMA and non-CREMA communities (Table 32) showed significant differences between the two groups. CREMA communities showed a more positive attitude towards wildlife than non-CREMA communities.

The impact of specific wildlife species was also tested for the two groups (Table 33). The comparison shows that 14 out of 19 wildlife species were significantly differently between the communities. Twelve out of 19 species were rated more positively in the CREMA communities than in non-CREMA communities. Only hyenas,

partridges and parrots were perceived more positively in non-CREMA communities than CREMA communities.

Table 33: Comparison of species impact by CREMA involvement

Wildlife	CREMA		non-CREMA		t	df	Sig. (2-tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Hyenas	1.04	0.32	1.20	0.68	-3.40	345.62	0.00
Partridges	1.19	0.49	1.57	0.93	-5.56	302.36	0.00
Parrots	1.35	0.88	1.62	1.24	-2.46	209.38	0.01
Rats	1.52	0.61	1.52	0.95	0.03	232.80	0.97
Elephants	1.56	0.95	1.78	1.12	-1.83	498.00	0.07
Patas monkeys	1.57	1.06	1.34	0.97	1.96	143.37	0.05
Other rodents	1.80	0.75	1.99	0.97	-1.83	498.00	0.07
Grass-cutters	1.83	0.92	1.57	1.04	2.29	498.00	0.02
Bushbuck	1.92	1.23	2.16	1.14	-1.83	498.00	0.07
Snakes	2.19	1.29	1.42	0.75	5.76	116.06	0.00
Scorpions	2.19	0.93	1.41	0.71	9.27	498.00	0.00
Insects	2.20	1.33	1.35	0.63	6.22	110.48	0.00
Warthogs	2.40	1.37	1.74	1.07	4.50	130.61	0.00
Other birds	2.41	1.05	2.18	1.09	1.92	498.00	0.06
Baboons	2.45	1.21	1.85	1.04	4.54	138.09	0.00
Vervet monkeys	2.50	1.21	2.08	1.10	3.18	142.59	0.00
Leopards	3.04	1.18	2.25	1.20	6.00	154.40	0.00
Waterbucks	3.32	1.24	2.54	1.17	5.73	146.63	0.00
Kobs	3.36	1.19	2.72	1.18	4.85	498.00	0.00

Likert scale of wildlife impact: 1=Strongly detracted, 2=Somewhat detracted, 3=Not sure, 4=Somewhat enhanced, 5=Strongly enhanced, CREMA N=100, non-CREMA N=400

The CREMA objectives of promoting the sustainable extraction of various harvestable botanical products/resources as well as promoting conservation oriented activities that support the local economy make CREMA communities better able to collaborate with PAs. Although individual CREMAs have their own objectives, all CREMAs generally seek wildlife conservation and sustainable resource use (MNP,

1994). According to (Agyare², 2013 pers. com) extensive community education and conservation awareness is undertaken by the Wildlife Division staff in the establishment of CREMAs. This is sometimes followed up by NGOs. For example, in the establishment of Murugu-Mognori CREMA, “A Rocha Ghana”, a local NGO, was involved in sensitization education and has since been helping in capacity-building in the management of Mognori Eco-Village tourism project, and monitoring the activities of the CREMA. This kind of activity facilitates better relationships with park management and also creates conservation consciousness. This explains why CREMA communities perceive wildlife impacts less negative than non-CREMA communities although wildlife behaviour may not be different in the CREMA and non-CREMA communities. This view is corroborated by Koch, (2004) who argues that CBNRM is an approach to convince local rural people of the value and importance of conservation. Jones and Murphree (2004) suggest that in Southern Africa, CBNRM has helped rural communities to tolerate the negative impacts of wild animals. They argue that residents are more willing to tolerate herbivores that eat crops or predators that kill livestock because they either gain benefit from wildlife or perceive the potential for gaining benefit.

However, hyenas, partridges, and parrots impact is more detracting in CREMA communities than non-CREMA communities. Hyenas are taboo in most of the Gonja communities and are associated with bad omen. All the two CREMA communities are in Gonja traditional area and may account for the high detraction in the CREMA communities. Partridges are common and widespread in the Mole area. They destroy crops by eating planted seeds and seedlings. They also dig holes around tubers and expose them to the sun. Parrots on the other hand destroy grains and cereals such as maize, guinea corn and millet. They are a problem for some of the communities. A socioeconomic survey conducted by the park in some communities such as Jelinkon, Mognori, Bawena, and Kparia listed the parrot as disturbing crops. Jelinkon and Mognori (CREMA communities) are among the communities that reported of parrots’ disturbance. Although fauna survey has not been made in these communities, key informants and focus groups reports of activities of certain species that are not reported in non-CREMA

² Andrew Agyare, a senior officer of Wildlife Division, Ghana

communities. The greater detracting of parrots in the CREMA communities may be due to high numbers of the species in the communities.

4.4.4.2 Community distance from the park boundary

The overall attitude towards wildlife (Q16 of Appendix G) was tested by comparing the community distance from the park (Table 34).

Table 34: Comparison of overall attitude to wildlife by community distance to the park

Attitude	Percentage of responses					
	Very positive	Somewhat positive	Neither positive nor negative	Somewhat negative	Very negative	(very +somewhat) positive
Less than 2km	38.2	34.2	3.4	11.6	12.6	72.4
More than 2km	34.7	35.7	7.3	10.3	12.0	70.4
Chi-Square=3.68, df=4, Sig.=0.45, Less than 2km N=200, More than 2km N=300						

A Cross tabulation comparison of overall attitude towards wildlife by community distance from the park (Table 34) showed no significant difference between two groups of communities. The “communities less than 2km” from the park are Kananto (0.1km), Larabanga (0.2km), Bawena (0.2km), and Mognori (0.3km) whereas “communities more than 2km from the park” include Zanwara (2.6km), Jang (3.8km), Jelinkon (6.9km), Holomuni (7.9km), Kparia (8.0km), and Ducie (8.5km). The impact of specific wildlife species was tested by the two distance groups: “communities less than 2km” from the park and “communities more than 2km” from the park Table 35.

Table 35: Comparison of wildlife impact by community distance from the park

Wildlife	Communities less than 2km		Communities more than 2km		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Hyenas	1.11	0.57	1.20	0.66	-1.69	468.20	0.09
Partridges	1.58	1.19	1.43	0.58	1.66	262.22	0.10
Rats	1.59	1.13	1.47	0.68	1.25	295.42	0.21
Scorpions	1.64	1.09	1.51	0.56	1.52	270.62	0.13
Grass-cutters	1.68	1.26	1.59	0.83	0.88	313.39	0.38
Insects	1.68	1.15	1.42	0.63	2.86	279.22	0.00
Patas monkeys	1.79	1.36	1.12	0.49	6.62	233.33	0.00
Snakes	1.82	1.26	1.41	0.59	4.30	257.14	0.00
Elephants	1.85	0.96	1.57	1.24	-2.77	352.81	0.01
Parrots	1.86	1.44	1.36	0.93	4.32	310.12	0.00
Other rodents	2.01	1.16	1.92	0.74	0.95	305.63	0.34
Baboons	2.12	1.42	1.87	0.81	2.22	285.79	0.03
Warthogs	2.29	1.48	1.59	0.78	6.06	273.33	0.00
Vervet monkeys	2.44	1.38	1.98	0.89	4.20	308.77	0.00
Bushbuck	2.47	1.32	1.87	0.98	5.43	340.92	0.00
Other birds	2.52	1.36	2.03	0.81	4.63	292.75	0.00
Leopards	2.58	1.49	2.29	1.03	2.36	324.34	0.02
Waterbucks	3.01	1.29	2.48	1.13	4.72	388.05	0.00
Kobs	3.10	1.34	2.68	1.08	3.63	361.87	0.00
Likert scale of wildlife impact: 1=Strongly detracted, 2=Somewhat detracted, 3=Not sure, 4=Somewhat enhanced, 5=Strongly enhanced Communities less than 2km N=200, Communities more than 2km N=300							

An Independent-Samples T Test comparison of wildlife impact by community distance from the park (Table 35) showed that 13 out of 19 species were significantly different between the two groups. All the mean scores of communities closer to the park were higher than the mean scores of communities farther away from the park. This means that communities closer to the park perceived wildlife impact less negatively than communities farther away from the park. This can be explained by possible cultural, entertainment, and tourism benefits these communities receive through wildlife.

The “communities less than 2km” from the park: Kananto (0.1km), Larabanga (0.2km), Bawena (0.2km), and Mognori (0.2km) are virtually sitting on the park boundary. They therefore have more frequent interactions with wildlife than those farther away from the park. Some of these interactions results in crop depredation and livestock attacks by wildlife. For example, elephants are notorious for crop raiding, baboons, raid crops and attack fowls, bushbuck eats yam and okra leaves, monkeys, especially patas monkeys, feed on all kinds of crops, warthogs uproots tubers and destroy other crops, parrots destroy maize, guinea corn, and millet, other birds such as hornbills destroy millet and guinea corn. Information from the park records indicates that communities closer to the park, particularly those closer to the park headquarters, suffer more from crop depredation by elephants than communities farther away from the park (MNP, 2011).

However, some of the interactions with wildlife are also positive. Some of the species have cultural and traditional significance in the form of totems and taboos. Species such as kobs, waterbucks and leopards create positive impact on some people because of their cultural value. Traditionally, some prominent chiefs in northern Ghana sit on the skin of wildlife animals such as waterbucks and kobs. These animals signify their traditional authority. For, example the Yagbonwura, the paramount chief of Gonja traditional area sit on the skin of kob. Wild cats such as the leopard also has cultural relevance for the people. The leopard symbolize wisdom and some tribes have the leopard as its totem. Traditional medical practitioners believe that the skin of the leopard is an antidote to bad omen and also use it as a talisman. The higher mean scores of these species in communities closer to the park than communities farther away from the park shows the perceived value that communities closer to the park have for these wildlife species.

Some species such as baboons and monkeys although destroy crops, are very entertaining and may create positive impact on the people. Two of the communities closer to Mole: Larabanga and Mognori are also very close to the park headquarters and see these animals on their daily routine compare to communities farther away from the park who hardly see the animals. These benefits may account for the higher mean scores of communities closer to the park than those farther away from the park. In addition,

Larabanga and Mognori are involved in tourism activities and as such although wildlife destroy their crops or attack their livestock, they see the presence of wildlife as a boost for tourism.

This results appears to differ from most studies. The negative impact describe earlier may occur as suggested by literature that crop damage caused by raiding wildlife is a prevalent form of human–wildlife conflict along protected area boundaries in the tropics (Naughton-Treves, 1998; Monney *et al.*, 2010) with proximity of farms to the boundary line being the strongest predictor of crop raiding by elephants (Naughton-Treves, 1998; Sam *et al.*, 2005). However, the perceived value of some of the wildlife species seems to be higher for most of the communities located closer to the park than communities farther away from the park.

4.4.4.3 Traditional area affiliation

The overall attitude towards wildlife (Q16 of Appendix G) was tested by traditional area affiliation (Table 36).

Table 36: Comparison of overall attitude to wildlife by traditional affiliation

Attitude	Percentage of responses					
	Very positive	Somewhat positive	Neither positive nor negative	Somewhat negative	Very negative	(very +somewhat) positive
Mamprusi	38.0	34.0	10.0	4.0	14.0	72.0
Gonja	36.4	34.7	5.7	11.5	11.7	71.1
Wa	34.0	37.0	4.0	12.0	13.0	71.0
Chi-Square=5.05, df=8, Sig.=0.75 Mamprusi N=50, Gonja N=350, Wa N=100						

A Cross tabulation comparison of overall attitude towards wildlife by traditional affiliation (Table 36) showed no significant differences amongst the traditional areas. The impact of specific wildlife species was compared by the traditional areas (Table 37).

Table 37: Comparison of species impact by traditional affiliation

Wildlife	Overall mean	Mean scores by traditional area			Scheffe result (p value)			ANOVA Measures	
		Mamprusi	Wa	Gonja	Mamprusi - Wa	Mamprusi - Gonja	Wa - Gonja	F	Sig.
Kobs	2.85	2.16	2.98	2.91	2.85	0.00	0.87	9.48	0.00
Waterbucks	2.69	2.02	2.42	2.87	0.16	0.00	0.00	14.19	0.00
Leopards	2.40	2.14	2.81	2.33	0.01	0.60	0.00	7.40	0.00
Other birds	2.22	1.36	2.33	2.32	0.00	0.00	0.99	18.83	0.00
Vervet monkeys	2.16	1.82	2.04	2.25	0.53	0.05	0.28	3.85	0.02
Bushbuck	2.11	1.86	2.13	2.14	0.41	0.28	1.00	1.29	0.28
Baboons	1.97	1.54	1.99	2.11	0.01	0.02	0.65	4.76	0.01
Other rodents	1.95	1.22	2.23	1.98	0.00	0.00	0.05	21.69	0.00
Warthogs	1.87	1.24	1.99	1.93	0.00	0.00	0.89	8.50	0.00
Elephants	1.74	2.24	2.01	1.59	0.46	0.00	0.00	12.19	0.00
Grass-cutters	1.62	1.26	1.26	1.78	1.00	0.00	0.00	14.20	0.00
Snakes	1.57	1.08	1.27	1.73	0.48	0.00	0.00	18.00	0.00
Scorpions	1.56	1.18	1.31	1.69	0.64	0.00	0.00	15.47	0.00
Parrots	1.56	1.34	1.39	1.64	0.97	0.24	0.17	2.77	0.06
Insects	1.52	1.24	1.56	1.55	0.11	0.07	1.00	2.85	0.06
Rats	1.52	1.60	1.28	1.57	0.11	0.98	0.01	4.56	0.01
Partridges	1.49	1.10	1.58	1.52	0.01	0.01	0.83	5.80	0.00
Patas monkeys	1.39	1.34	1.10	1.48	0.37	0.65	0.00	5.82	0.00
Hyenas	1.17	2.12	1.01	1.07	0.00	0.00	0.58	87.60	0.00

Likert scale of wildlife impact: 1=Strongly detracted, 2=Somewhat detracted, 3=Not sure, 4=Somewhat enhanced, 5=Strongly enhanced.
Mamprusi N=50, Wa=100, Gonja N=350, Overall Communities N=500

An ANOVA comparison of wildlife species impact by traditional affiliation (Table 37) showed that seven out of 19 species were statistically significant in the Gonja traditional area, six in the Wa traditional area, and three in the Mamprusi traditional area. The variability in the perception of wildlife impacts in different traditional areas reflects cultural valuation of wildlife in the different communities.

The mean score of the Mamprusi traditional area for elephant is the highest. The Mamprusis have the elephant as their totem and celebrate the “Damba” festival yearly in connection with the totemic animal (Conservation International, 2005). This explains why the Mamprusi have a higher mean score for elephants than the Wa and Gonja. The Mamprusi traditional area also had the highest mean scores for hyenas and rats. Hyenas are not tabooed by the Mamprusis that is why the mean score was higher in Mamprusi than in the Wa and Gonja traditional areas where the hyena is a taboo that signify bad omen. Rats are important agricultural pests that destroy both stored food particularly grains and crops in the field. Rats are among the top three wildlife species that impact negatively on the adjacent communities. Although, they are common and widespread they appear to be more in certain parts of the park and that may account for their high mean scores in the Mamprusi traditional area.

The Wa traditional area had the highest mean scores for kobs, leopards, warthogs, partridges, other birds, and other rodents. Traditionally, Wa Na, the paramount chief of the Wa traditional area, sits on the skin of a kob (Conservation International, 2005). This may explain the high mean score of kobs in the Wa traditional area. Leopards have various traditional and cultural uses. Some tribes have adopted leopards as their totem and it is known to portray wisdom. Traditional medical practitioners believe that the skin of the leopard is an antidote to bad omen and also use it as a talisman. Warthogs, partridges, other birds such as hornbills, and other rodents such as squirrels are all species that destroy crops. Their high mean scores Wa traditional area may indicates relatively lesser destruction to crops by these species in Wa traditional area than the other traditional areas. Other taboo animals in the traditional area include royal python, hippopotamus, and crocodile.

The Gonja traditional area has the highest number of communities surrounding Mole and was represented by seven communities in the study. The traditional area had the highest number of species with the highest mean scores amongst the traditional areas. Waterbucks, vervet monkeys, and baboons were rated more positively in Gonja traditional area than the others. Some chiefs in the traditional area sit on the skin of waterbucks. Traditional medical practitioners use parts of the animal for medicine.

Vervet monkeys and baboons are common and widespread in the Mole area (Appendix H) and are very entertaining. They are social in their behaviour and sometimes adults are seen carrying young ones. Although, these species, destroy crops, their cultural relevance, social behaviour and entertaining nature may account for why they are perceived more positively in the Gonja traditional area. Gonja also had the highest mean score for grass-cutters. Grass-cutters are widespread and agricultural pests. People can obtain a licence from the Wildlife Division and hunt grass-cutters outside parks and reserves as bush-meat. Bush-meat is an important source of protein for rural communities. Their high numbers in traditional area and being a source of bush-meat may explain why grass-cutters were rated more positive in Gonja traditional area than other traditional areas.

On the other hand, the mean scores of Gonja for patas monkeys, scorpions, and snakes were highest amongst the traditional area but less positive than the other species. Patas monkeys are widespread (Appendix H) and feed on crops and wild fruits that the people depend on including shea nuts and African locust bean multi-purpose economic trees in northern Ghana. Scorpions and snakes generally detract from the experience of adjacent communities. Their high mean scores in Gonja may imply relatively less detraction in Gonja than other traditional areas.

There are various traditional and cultural values associated with wildlife in Gonja communities. For example, in Bawena the tail of the elephant is used during a cultural dance in the death of a prominent person in the community, whereas in some communities, the bones of wild animals are used in certain rituals including co-burial when a great hunter dies. There are also different taboo animals in different communities. For instance, the bushbuck is revered in Jelinkon and not killed or eaten. The warthog is taboo in some communities and not eaten in Muslim communities. The people of Jang hold the royal python as a taboo. Tradition dictates that the Yagbonwura, the paramount chief of the Gonja traditional area, is not supposed to see an elephant. It is therefore not surprising that the communities of the traditional area had the least mean score for elephants amongst the traditional areas.

Taboo animals are culturally forbidden to be harmed, killed or eaten. For example, the bushbuck is a traditional taboo animal which according to local custom may

not be hunted or eaten within Jelinkon's territory, whether by residents or visitors (Robinson, 2011). However, there are instances when there are overlapping conflicting interests in the same traditional area. For example, the people of Jinfrono forbid the killing of the crocodile, but it is a delicacy in Bawena which is about four kilometres away from Jinfrono (MNP, 1994). These different valuation of wildlife, based on traditional and cultural values help explain the variability in the perception of wildlife impacts in the different traditional areas.

There are other wildlife species that were not included in the survey list but were mentioned by the communities as either detracting or enhancing their experience of living near the park. These include hornbills and squirrels, both mentioned as destroying crops. Hornbills destroy cereals such as sorghum and millet whilst ground squirrels eat planted seeds. Buffalos were mentioned as detractors, particularly injured ones, as they are very dangerous. However, roan antelopes, a giant horse-like antelope, were mentioned as having a positive impact on the people and some chiefs sit on the skin of the roan.

4.4.5 Socio-economic influence

Socio-economic variables are not a main influence on perceived wildlife impact. However, there were some significant differences between age groups and gender in the perceived impact of wildlife species.

4.4.5.1 Age

The overall attitude towards wildlife (Q16 of Appendix G) was tested by age groups (Table 38).

Table 38: Comparison of overall attitude to wildlife by age

Attitude	Percentage of responses					
	Very positive	Somewhat positive	Neither positive nor negative	Somewhat negative	Very negative	(very +somewhat) positive
Youth	40.0	31.7	7.4	10.0	10.9	71.7
Adults	32.7	37.9	4.5	11.5	13.4	70.6
Chi-Square=5.91, df=4, Sig.=0.21, Youth N=231, Adults N=269						

A Cross tabulation comparison of the overall attitude towards wildlife by age groups (Table 38), showed no significant difference between youth and adults. The youth

age bracket is 16-35years whereas the adult is 36years and above (MYS, 2010). The impact of specific wildlife species was also tested by the two age groups Table 39.

Table 39: Comparison of wildlife species impact by age

Wildlife	Youth		Adults		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Kobs	2.94	1.23	2.77	1.18	1.65	498.00	0.10
Waterbucks	2.81	1.24	2.59	1.21	1.92	498.00	0.06
Leopards	2.39	1.25	2.41	1.23	-0.17	498.00	0.87
Other birds	2.26	1.16	2.19	1.02	0.67	461.31	0.50
Vervet monkeys	2.24	1.20	2.10	1.07	1.38	465.18	0.17
Baboons	2.00	1.18	1.95	1.03	0.53	498.00	0.60
Bushbucks	2.27	1.26	1.97	1.05	2.89	448.95	0.00
Other rodents	1.91	1.01	1.99	0.86	-0.85	452.12	0.40
Warthogs	2.00	1.25	1.75	1.08	2.40	498.00	0.02
Elephants	1.73	1.18	1.75	1.02	-0.20	498.00	0.84
Grass-cutters	1.64	1.12	1.61	0.93	0.29	498.00	0.77
Rats	1.59	1.00	1.46	0.78	1.62	434.50	0.11
Snakes	1.58	0.99	1.56	0.89	0.22	498.00	0.82
Scorpions	1.53	0.85	1.59	0.79	-0.91	498.00	0.36
Partridges	1.50	0.93	1.48	0.83	0.29	498.00	0.77
Parrots	1.49	1.16	1.62	1.21	-1.20	498.00	0.23
Insects	1.49	0.88	1.55	0.89	-0.77	498.00	0.44
Patas monkeys	1.49	1.15	1.30	0.83	2.08	410.80	0.04
Hyenas	1.18	0.65	1.16	0.60	0.38	498.00	0.70

Likert scale of wildlife impact: 1=Strongly detracted, 2=Somewhat detracted, 3=Not sure, 4=Somewhat enhanced, 5=Strongly enhanced, Youth N=231, Adults N=269

An Independent-Samples T Test comparison of the wildlife species impact (Table 39), showed that three out of 17 species were significantly different between the two age group. Youth had higher mean scores for all the three significantly different species:

warthogs, patas monkeys, and bushbucks than the youth. The three species are noted for the destruction of crops. Warthogs are noted for digging tubers and destroying other crops. Patas monkeys are common and widespread in the Mole area and feed on crops and wild fruits that humans depend on, whilst bushbucks eat the leaves of okra and yam. Adults, who are more involved in farming are more concerned about the activities of these animals than the youth, most of whom do not own farms. That may explain why there was greater detraction in adults than the youth.

4.4.5.2 Gender

The overall attitude towards wildlife (Q16 of Appendix G) was tested by gender (Table 40).

Table 40: Comparison of overall attitude to wildlife by gender

Attitude	Percentage of responses					
	Very positive	Somewhat positive	Neither positive nor negative	Somewhat negative	Very negative	(very +somewhat) positive
Males	39.7	32.2	6.9	9.6	11.6	71.9
Females	29.6	40.2	3.9	12.8	13.5	69.8
Chi-Square=8.46, df=4, Sig.=0.07, Males N=321, Females N=179						

A Cross tabulation comparison of the overall attitude towards wildlife by gender (Table 40), showed no significant difference between males and females. The impact of specific wildlife species was also tested by gender Table 41.

Table 41: Comparison of wildlife species impact by gender

Wildlife	Males		Females		t	df	Sig. (2- tailed)
	Mean	Std. Dev.	Mean	Std. Dev.			
Kobs	2.89	1.24	2.77	1.15	1.17	392.30	0.10
Waterbucks	2.76	1.25	2.56	1.18	1.77	385.58	0.06
Leopards	2.45	1.24	2.33	1.24	1.00	498.00	0.87
Other birds	2.25	1.10	2.18	1.06	0.69	498.00	0.50
Bushbucks	2.15	1.18	2.03	1.13	1.10	498.00	0.17
Vervet monkeys	2.13	1.14	2.22	1.12	-0.90	498.00	0.60
Baboons	1.95	1.06	2.01	1.18	-0.51	498.00	0.61
Other rodents	1.94	0.88	1.97	1.01	-0.36	498.00	0.40
Warthogs	1.81	1.14	2.00	1.20	-1.38	498.00	0.67
Elephants	1.71	1.09	1.78	1.10	-0.67	363.52	0.84
Scorpions	1.61	0.86	1.49	0.73	1.60	498.00	0.77
Grass-cutters	1.60	0.98	1.66	1.09	-0.61	498.00	0.11
Insects	1.54	0.90	1.49	0.86	0.68	498.00	0.82
Rats	1.54	0.89	1.49	0.90	0.60	498.00	0.36
Parrots	1.50	1.11	1.68	1.31	-1.54	320.78	0.77
Snakes	1.64	0.82	1.45	0.99	2.22	429.84	0.00
Partridges	1.45	0.81	1.56	0.99	-1.24	310.32	0.44
Patas monkeys	1.35	0.93	1.46	1.08	-1.13	325.26	0.04
Hyenas	1.21	0.43	1.09	0.71	2.35	495.00	0.03

Likert scale of wildlife impact: 1=Strongly detracted, 2=Somewhat detracted, 3=Not sure, 4=Somewhat enhanced, 5=Strongly enhanced. Males N=321, Females N=179

An Independent-Samples T Test comparison of wildlife species by gender (Table 41), showed only two of 19 species were significantly different between males and females. Males had higher mean scores for both hyenas and snakes. Hyenas are uncommon but widespread in the Mole area (Appendix H) and the highest ranked species in terms carnivore-human conflict in Mole (MNP, 2011). They attack livestock and are also tabooed, being associated with bad omen. In 2010, a hyena attacked a mentally retarded woman in Kananto. The news of the attack is well known among the communities and may account for why hyena detracted is higher in females than males.

Males also had a higher mean score for snakes. Bush snakes and other species of snakes are common in Mole and generally detract from the experience of the people. When females are with their male counterparts, the male usually assist in killing snakes. However, certain activities such as fetching water from water sources like rivers and streams, fetching wood fuel, collection of NTFPs such as wild fruits are usually done by females. Under such circumstances, encounter with snakes are very scary. This may explain why snake detraction was rated higher in females than males.

4.4.6 Measures to enhance positive human-wildlife interactions and mitigate negative ones

Respondents were asked to score possible ways of enhancing or mitigating human-wildlife interactions (Q13 of Appendix G) on a Likert scale (Table 42).

Table 42: Perceived effectiveness of enhancement or mitigation measures of wildlife impacts

Enhancement or mitigation measures	Percentage of responses				Mean	Std. Dev.
	1	2	3	4		
Park ranger patrols	14.2	17.0	18.2	50.6	3.05	1.12
Not clearing forest near water bodies	13.4	22.8	24.2	39.6	2.90	1.07
Keeping livestock in pens	11.8	32.0	28.0	28.2	2.73	1.00
Using scarecrow	16.8	33.2	26.4	23.6	2.57	1.03
Scaring wildlife	19.0	40.6	23.2	17.2	2.39	0.98
Building viewing platforms	23.4	25.2	14.6	36.8	2.65	1.20
Not farming close to park boundary	25.6	33.2	17.6	23.6	2.39	1.11
Buffer between community and park boundary	26.0	28.6	17.8	27.6	2.47	1.15
Guarding farms	30.0	29.6	17.4	23.0	2.33	1.13
Avoid growing crops that attract wildlife	45.4	37.4	10.8	6.4	1.78	0.88
Pepper grease fence	47.4	27.2	11.0	14.4	1.92	1.08
Likert scale of effectiveness: 1=Not at all effective, 2=Low effectiveness, 3=Medium effectiveness, 4=High effectiveness, N=500						

Keeping livestock in pens, not clearing forest, and park ranger patrols were rated as the top three measures for enhancing or mitigating human wildlife interactions with park ranger patrols having the highest mean score. Respondents were asked to select the three most effective measures from the list provided (Q15 of Appendix G) Table 43.

Table 43: The most effective enhancement or mitigation measures of wildlife impacts

Enhancement or mitigation measures	Percentage of responses			
	1st most effective measure	2nd most effective measure	3rd most effective measure	Total Effectiveness (1st, 2nd, and 3rd)
Park rangers patrol	29.8	15.00	14.8	59.6
Keeping livestock in pens	18.6	13.20	15.8	47.6
Not clearing forest near water bodies	13.6	10.40	12.4	36.4
Building viewing platforms	5.8	13.20	8.2	27.2
Scaring wildlife	5.8	12.20	8.6	26.6
Not farming close to park boundary	9.6	4.60	10.8	25.0
Using scarecrow	4.8	10.60	6.8	22.2
Buffer between community and park boundary	5.2	8.60	6.8	20.6
Guarding farms	2.0	6.20	8.4	16.6
Pepper grease fence	3.6	4.00	4.0	11.6
Avoid growing crops that attract wildlife	1.2	2.00	3.4	6.6
Likert scale of effectiveness: 1=Not at all effective, 2=Low effectiveness, 3=Medium effectiveness, 4=High effectiveness, N=500				

The most effective perceived enhancement or mitigation measures of wildlife impacts are: park ranger patrols, keeping livestock in pens, and not clearing forest near water bodies (Table 43). The results of Table 43 and Table 42 are similar indicating strong convergent validity for the top three enhancement and mitigation measures.

Managing the impact of wildlife on local communities' calls for an understanding of the perceived impact. Park patrols have been the traditional method of policing the park and obviously continue to be a useful measure. However, key informants and discussion groups also suggest that it could be improved. Records from the park indicate high ranger patrol activities using blasters as deterrents reduces elephants crop raiding (MNP, 2011).

It is interesting that the communities rated protecting water bodies by not clearing forest around them as an effective measure of managing wildlife impact. This rating was higher in communities experiencing some form of tourism or those with tourism potential. Communities should be encouraged to embark on afforestation of denuded river banks as well as to protect water bodies by not cutting trees along the banks. The protection of water bodies attracts wildlife species and for communities experiencing tourism or those with tourism potential, the build-up of wildlife numbers in the communities will boost tourism.

Keeping livestock in pens is the next ranked perceived effective mitigation measure. The park-adjacent communities practice mainly free range livestock keeping. This makes livestock ready prey for wildlife species. The communities should be encouraged to practice semi-intensive livestock rearing. The domestic animals could be left to range freely during the day-time when there are people around. However, at night they should be kept in pens to avoid attacks by wildlife. This follows the finding of Gusset et al., (2009) that corralling livestock at night reduces predation. Information from the park records showed that hyenas are the species that mostly attack livestock. Designing appropriate pens and keeping livestock in the pens in the night will therefore reduce the attacks by the hyenas. Some literature suggests that predation may be reduced by corralling livestock at night if adjusted for the type of livestock kept and predator involved. For example, the height of the pen is determined by the type of predator. Usually higher walls are more difficult for both predators and livestock to penetrate (Ogada et al., 2003; Woodroffe et al., 2007a)

The communities' rating of avoiding growing crops that attract wildlife at "least effective mitigation measures" needs to be re-examined. Farming close to the park

boundary predisposes the farms to crop depredation by wildlife which find the farms an easy source of food. Communities should therefore be educated and encouraged to switch to crops that do not attract wildlife when they have to farm closer to the park boundary. Records from the park indicate that root and stem tubers like yam and cassava as well as maize and beans are preferred by elephants (MNP, 2011). It is therefore important that farmers avoid these crops and switch to crops that are less attractive to wildlife, for example chilli pepper in the case of elephants (Hedges and Gunaryadi, 2010). Money accrued from the sale of such crops could be used to purchase staples that would be destroyed by wildlife when grown. The switch from staples to condiments could be challenging but could give farmers some income instead of losing all crops from elephant raiding. Farmers could also experiment with some staple indigenous crops such as millet and sorghum.

Pepper grease fencing is also a deterrent that has worked in preventing elephant crop raiding in some places (Conservation International, 2006; Monney et al., 2010). Dried hot chilli powder mixed with old engine oil (chilli-grease) is applied to rope fences and to cloth spacers attached to these fences. It gives off an odour that deters elephants from coming to the farm. This could be introduced in communities around Mole National Park and community members encouraged to use it.

4.4 Conclusions and Recommendations

This section provides a summary of the key findings so as to draw conclusions and then give recommendations. The key findings of the study are:

1. The majority of people surveyed had positive attitude towards wildlife in general. However their response to specific species showed mixed results that were generally negative.
2. Attitudes about specific wildlife vary and some of the reasons for this variability were explored in this study. The strongest predictor of attitude towards wildlife is whether the community is involved in a CREMA, followed by distance from the park, traditional area, and then the age of individuals.

3. CREMA communities are more tolerant to wildlife and perceive their impacts more positively than non-CREMA communities.
4. Communities closer to the park although suffer from crop depredation and livestock attacks by wildlife, have a more positive attitude towards wildlife than communities farther away from the park because of the benefits they receive through wildlife such as cultural value, entertainment and tourism.
5. Traditional and cultural values also influence the way communities perceived the impact of wildlife. Taboo species are not harmed, killed or eaten and are tolerated although they may be considered problematic in other communities.
6. Age is the strongest demographic variable predicting perceived impact but only shows differences amongst three species where youth who are not involved in farming are more positive towards wildlife than adults who are mainly farmers.
7. Park ranger patrols, keeping livestock in pens, and protecting water bodies by not clearing forest were ranked as the top three enhancement and mitigation measures for preventing negative human-wildlife interactions.

In conclusion, the challenges of increasing social conflict over wildlife issues are borne from human perspective about wildlife (Teel and Manfredo, 2010). The way a group of people perceive wildlife determines how they choose to interact with wildlife.

The study reveals that valuation of wildlife species by PA adjacent communities determines how people choose to relate with wildlife. Cultural views influence the perception of wildlife impact. Species of cultural relevance are revered and held in high esteem. Taboo animals are not harmed, killed or eaten, and are tolerated although they may be considered as problematic in other communities.

Although communities closer to PAs suffer from crop depredation and livestock attacks by wildlife they have a more positive attitude towards wildlife than those farther away from PAs due to the benefits they derive or perceive from wildlife. Communities closer to PAs are more likely to see wildlife, some of which are very entertaining, and these communities may also derive religious/spiritual benefits from wildlife. All these

influence the positive perception of wildlife impact by communities closer to PAs. This is in contrast to some literature which suggests that communities closer to PAs may have more negative views of wildlife due to the costs they suffer such as crop depredation and livestock attacks (Naughton-Treves, 1998; Patterson et al., 2004).

CREMA, a variant of CBNRM in Ghana, helps communities tolerate wildlife and perceive their impacts more positively than non-CREMA communities. CBNRM is an approach that convinces local rural people of the value and importance of conservation (Koch, 2004) and helps rural communities to tolerate the negative impacts of wild animals (Jones and Murphree, 2004). PA adjacent communities involved in CBNRM are more willing to tolerate herbivores that eat crops or predators that kill livestock because they either gain benefit from wildlife or perceive the potential for gaining benefit. It is therefore imperative that PAs collaborate with adjacent communities in PA management and seek to serve both conservation and development objectives.

On the basis of these conclusions the paper recommends the following:

1. Park management should incorporate local indigenous knowledge in the form of values, culture, and taboos into the management of human- wildlife issues.
2. Park management needs to intensify interventions to minimize the effect of crop depredation which raises food security concerns and affects rural livelihoods.
3. Park-adjacent communities should practice semi-intensive livestock rearing to minimize wildlife attacks on free ranging livestock.
4. Farming very close to the park boundary should be discouraged and when it becomes necessary to farm near the boundary, farmers should cultivate crops that do not attract wildlife.

Chapter 5: Conclusions

5.0. Introduction

Challenges of biodiversity conservation including human-wildlife interactions are of growing concern globally. This study explores how humans interact with wildlife in relation to different audiences, specifically tourists and PA-adjacent communities. The study was designed around three main research questions, which were addressed throughout the three distinct research papers presented. This chapter revisits and highlights the main findings of the study and situates it in relation to the broader literature on conservation, tourism, and needs of local communities. The chapter ends with the main contributions of the study, and makes recommendations. The study was designed to address the following research questions:

1. How do human-wildlife interactions impact on nature-based tourism in Mole National Park and in nearby communities?
2. How do adjacent communities perceive the concerns and benefits of living near Mole National Park, and what factors explain the differences in these perception of concerns and benefits?
3. How do park-adjacent communities perceive wildlife impacts, and how are the perceptions of wildlife shaped by culture, CREMA involvement, and a community's distance from the park?

Tourism in PAs as a mechanism for conservation and development offers significant opportunities to local communities in the developing world and can act as a useful tool to reduce poverty (Chok et al., 2007; Scheyvens and Momsen, 2008). The Protected Areas and Poverty Reduction (PAPR) project which sponsored this research places human-wildlife interactions as one of its main thematic areas of interest. This theme explores how best to manage human-wildlife interactions in and around PAs to reduce poverty in adjacent communities. Nature-based tourism is used in this study to address the conservation and development conundrum. The overarching focus of this study was on how human-wildlife interactions impact nature-based tourism, with the

broader aim of informing tourism development in Mole National Park and in nearby communities. A variety of research instruments were used, including key informant interviews, focus groups, field observations, and surveys to gather data from tourists and a diverse range of communities that surround Mole National Park.

Chapter Two explored the relationship between human-wildlife interactions and nature-based tourism. Tourists showed high levels of satisfaction with fundamental attractions such as wildlife and the environment. However, managerial deficiencies were noted in terms of infrastructure and services. Key insights were that tourism in Mole has space for expansion and could benefit from being linked with heritage tourism already flourishing in Ghana.

Chapter Three focused on the concerns and benefits of park-adjacent communities and found that park-adjacent communities have an overall positive attitude towards the park. Perceptions of concerns and benefits vary in the communities and need to be managed so that concerns do not outweigh benefits in order to ensure support for conservation. Communities involved in tourism and the CREMA variant of community based natural resources management (CBNRM) in Ghana help communities tolerate wildlife because of the benefits they gain from wildlife.

Chapter Four, looked at the cultural valuation of wildlife and effective enhancement and mitigation measures of human-wildlife issues. Cultural valuation of animals informs how people relate with wildlife. Taboo and totemic animals are revered, not killed or eaten, and tolerated, although the same species may be considered problematic in other communities. Park ranger patrols, keeping livestock in pens, and protecting water bodies were rated as effective mitigation measures in addressing human-wildlife issues.

A summary of the study's key findings and recommendations follows.

5.1 Key findings of the study

5.1.1 Human-wildlife interactions and nature-based tourism

The study revealed that tourists showed high levels of satisfaction with fundamental attractions like wildlife and the environment. Satisfaction with the experience in nature-

based tourism is based on two fundamental components: “(1) appropriate levels of environment quality, and (2) suitable levels of consumer service” (Eagles, 2002 p.132). Tourists were satisfied with the first component, which included the park’s wildlife component. However, tourists were less satisfied with the second component, suitable levels of customer service. A number of managerial features such as accommodation, food services, and visitor centre were rated low by tourists. Private partnerships could be sought to develop and improve accommodation and food services in the park. Currently, the Commercial Development Unit of the Wildlife Division, and Mole Management have accepted a tender for the investment opportunities within the concession sites (MNP, 2011). Private partnership could inject the needed capital for tourism development in Mole. Although Mole does not have the potential to compete with parks in eastern and southern Africa in terms of abundance of wildlife, it is unique as a savannah national park that offers opportunity to see wildlife, particularly elephants, baboons, monkeys, kobs, bushbucks, warthogs, crocodiles and a large avian population at close range. It also benefits from other attractive features such as waterfalls, and cultural and historical sites. It could, therefore, become an important regional tourism destination.

The tourist experience in Mole is highly influenced by the nature of the guided tour. Both foot and drive safari tours with tour guides are used to ensure the safety of tourists and also offer interpretation. The guided tours have the positive influence of controlling visitor behaviours in ways that minimize impacts on wildlife and other park resources. However, effective interpretation that creates awareness of conservation and local cultures is lacking. Interpretation can provide the critical link between visitor satisfaction and visitor support for conservation (Hvenegaard, Shultis and Butler, 2009). Management should therefore focus on equipping tour guides with the needed skills to ensure visitor satisfaction.

One of the benefits of tourism in protected areas is support for conservation. Positive park experiences create the opportunity to increase support for conservation, but this usually requires effective interpretation. However, the study found that interpretation by guides was not consistent, and when interpretation was provided, it tended to focus narrowly on the identification of wildlife or plants, with little attention given to broader

issues like the role of protected areas in maintaining biodiversity or a discussion of Ghana's cultural heritage.

Protected areas can be a solution to poverty and a magnet for the poor (Adams et al., 2004; Andam et al., 2010). Economic benefits that offset some of the livelihood challenges created by PAs, such as damage to crops or livestock by park wildlife, are therefore paramount. One example of such tourism benefits is provided by the community of Mognori which has developed a significant tourism industry based on guided nature experiences and cultural experiences; however, other communities lag behind. The successes at Mognori are likely due to the close proximity to the park headquarters, and the support of an NGO, A Rocha Ghana. Ghana lacks many of the financial resources required to implement nature tourism programs in communities near to national parks, and so must rely on partnerships with NGOs or the private sector. In this regard, assistance could be sought from Nature Conservation Research Centre (NCRC) one of Ghana's leading indigenous conservation organisation in developing rural ecotourism and community protected areas as a means of economic development and resource conservation.

Park management, in an effort to diversify and expand tourist activities within Mole National Park, has proposed the development of community-managed bush camps near Kparia and Polzen waterfalls. The construction of these bush camps would meet the demand of tourists who would like to see their contributions going directly to benefit the community and who also prefer an overnight stay after their Kparia or Polzen falls experience (MNP, 2011). Again private partnerships are being looked to for developing such facilities. The development of such facilities not only opens up the park but also provides job opportunities for the nearby communities and provides the economic benefits that offset the livelihood challenges of living near the park, creating a long term solution to the reduction of poverty.

Mole has the potential for expansion which is well captured in the park's management plan. "Mole National Park is currently under-utilised and that even if all the developments that are currently being proposed are put in place, there will still be no danger that the park will become overcrowded with tourists during the lifetime of this

plan” (MNP, 2011 p. 49). Tourism development in Mole could also be linked with associated landmarks of slave route tourism. There was a major slave trading route and an ancient caravan route between Salaga and Mali which passes through the park. There are also caves that were used by slave raiders and during the tribal wars in the 18th century. Other caves, such as the Gbanwele Caves, have further archaeological and historical importance (MNP, 2011). These features could be developed and made accessible for tourists.

The linking of the slave trade route and historical sites to the park could attract the African diaspora audience. There is also an annual paragliding event during Easter holidays on the Kwahu Mountains in the eastern region of Ghana which attracts many expatriates. Mole could take advantage of tourists visiting Ghana who may not be aware that one can have an African wildlife experience without travelling to southern or eastern Africa. There is also a growing middle class population in Ghana (Ghana Statistical Service, 2010) which could be targeted as tourism in Mole expands.

Tourism in Mole National Park is at an early stage in the “product life cycle” (Bulter, 1980; Duffus and Dearden, 1990). For tourism development to serve both conservation and development outcomes, appropriate planning and resourcing of tourism development is required. Although expanded tourism has its own associated challenges, nature-based tourism, when properly developed and managed, can provide economic benefits to nearby communities, which can offset negative impacts associated with the creation of protected areas (Brockelman and Dearden, 1990). The perceptions of local communities in Mole are discussed in the next section.

5.1.2 Adjacent communities’ perception of concerns and benefits

The perception of concerns and benefits of living near PAs like national parks affects the way adjacent communities perceive conservation. According to social exchange theory, understanding the exchange of resources (concerns and benefits) among individuals and groups (PAs and adjacent communities) is an interactive situation that affects the support that local communities give to conservation (Andereck et al., 2005). One of the thematic areas of the Protected Areas and Poverty Reduction (PAPR) project is the flow of cost and benefits in park-adjacent communities. The second overall

research question of the study was to examine how adjacent communities perceive concerns and benefits of living near Mole National Park, and the factors that explain the differences in the perception of concerns and benefits.

The study shows that the park-adjacent communities have an overall positive attitude towards the park. However, their response to specific concerns and benefits shows a mixed perception about the park and overall costs outweigh benefits. This apparent contradiction is perhaps not as unusual as it seems. Research (Lunn and Dearden 2006) shows that often people are in agreement about the desirability of large and general goals (for example world peace, conservation, saving the whales, sustainable fisheries), but have much lower levels of agreement to specific details and approaches. It is not unreasonable to think that local villagers appreciate the value of the park both for themselves and future generations, but, at the same time, are keenly aware of some of the daily challenges to their livelihoods presented by the park. Nonetheless, this apparent contradicting posture of park-adjacent communities cannot be overlooked. Perceptions shape behaviours and it is imperative for PAs to be able to serve both conservation and development outcomes which is one of the things that the PAPR project seeks to achieve by looking at ways to reduce poverty levels in communities adjacent to PAs.

The study highlights that community resource management areas (CREMA)--a variant of community based natural resource management (CBNRM) in Ghana--enable PA-adjacent communities to perceive benefits higher than concerns. CBNRM has the potential to convince local rural people of the value and importance of wildlife protection and conservation (Koch, 2004). CBNRM arrangements allow local stakeholders to participate actively in the sustainable utilization and control of their natural resources which is important because community members who actually live in, and depend on, a given ecological niche should have an interest in conserving that resource (Ukaga and Maser, 2004, Hauzer et al., 2013). Local communities' participation in PAs management has been recognised as important for almost three decades now (McNeely and Miller, 1985) but its implementation has been slow and varies from place to place. CBNRM in southern African countries has seen mixed results (Jones and Murphree, 2004) mainly because of a lack of proper execution and management of the concept. This study has

shown that CBNRM such as CREMA is increasingly relevant in helping meet conservation and development outcomes. Biodiversity erosion continues at unprecedented levels (Burchart et al., 2010), necessitating global agreements to expand the areas set aside as PAs in the Aichi Biodiversity Targets (CBD, 2011). As this expansion occurs, increasing numbers of communities will become “PA-adjacent,” leading to an even greater need to understand the concerns and benefits of PAs to local communities. Local communities’ participation, especially in properly executed and managed CBNRM, should be the way forward in PAs management.

Although this study did not measure economic impact, communities closer to the park particularly tourism communities, were better off than other communities judging from their attractiveness. Also communities closer to the park, although they too have many concerns, rated park benefits higher than communities farther away from the park. This corroborates the findings by Wittemyer et al., (2008) that communities on the edges of PAs draw people because of the benefits they enjoy. The benefits have implications for poverty reduction and community well-being. This may explain why, in spite of the challenges of living near PAs, some park-adjacent communities’ still draw people to live in these places, an indication of the improvement of the well-being of such communities.

Communities involved in tourism rated benefits higher than communities which are not involved in tourism and were very appreciative of their strategic location. This study corroborates the findings that tourism in PAs offers significant opportunities to local communities in the developing world as a useful tool to reduce poverty (Brockelman and Dearden, 1990; Chok et al., 2007). However, tourism needs to be managed properly to minimize unintended consequences such as tourist intrusion and cultural adulteration.

5.1.3 Adjacent communities’ perception of wildlife

The challenges of increasing social conflict over wildlife issues are born from human ideology and perspectives in regard to wildlife (Teel and Manfredi, 2010). The way a group of people perceive wildlife determines the way in which they choose to interact with wildlife. Human-wildlife interaction is one of the streams of inquiry in the Protected Areas and Poverty (PAPR) project. The third overall research question of the current study is how do park-adjacent communities perceive wildlife impacts, and how are the

perceptions of wildlife shaped by culture, CREMA involvement, and a community's distance from the park?

The study shows that cultural valuation of wild animals shapes the perception of wildlife impacts. Species of cultural relevance are revered and held in high esteem. Taboo animals are not harmed, killed or eaten and are tolerated, although they may be considered as problematic in other communities. For example, the Jelinkon community reveres the bushbuck and the animal is forbidden to be killed or eaten within Jelinkon territory whereas the Mamprusi traditional area has the elephant as its totem and celebrates the "Damba" festival in reference to the elephant. The cultural valuation of wildlife has an impact on conservation outcomes. Taboo animals or those adopted as totems are revered and protected.

Community participation in PA management such as CREMA promotes tolerance of wildlife. Wildlife impacts are perceived more positively in CREMA communities than non-CREMA communities. This finding corroborates literature which suggests that CBNRM helps rural communities to tolerate the negative impacts of wild animals because they either gain benefit from wildlife or perceive the potential for gaining benefit (Jones and Murphree, 2004). It is therefore imperative that PAs collaborate with adjacent communities in PA management and seek to serve both conservation and development outcomes

Communities closer to PAs, particularly communities involved in tourism rated wildlife impacts more positively than those farther away from PAs probably due to the benefits they derive from wildlife in relation to tourism flows to and from the park. In addition, communities closer to PAs are more likely to see wildlife, some of which are very entertaining, and communities also derive religious-spiritual benefits from certain species. This finding contrasts with literature that suggests that communities closer to PAs perceive wildlife impacts more negatively due to the cost they suffer such as crop depredation and livestock attacks (Naughton-Treves, 1998; Patterson et al., 2004).

Managing the impact of wildlife on local communities requires understanding the impact of wildlife on communities. The study showed that the most effective perceived

measures of enhancing or mitigating human-wildlife interactions are: park ranger patrols, protection of water bodies, and keeping livestock in pens. Park patrols are a traditional and effective measure of policing the park to minimize the impact of wildlife on adjacent communities. Park management should intensify patrols especially during harvest seasons to minimise crop raiding by livestock which raises food security and livelihood concerns.

Protecting water bodies was rated as an effective measure of managing wildlife impact by communities involved in tourism or those with tourism potential. Water bodies attract wildlife species and for communities experiencing tourism or those with tourism potential, the build-up of wildlife numbers will boost tourism.

Keeping livestock in pens was also ranked as an effective mitigation measure. This corroborates the literature which reports that kraaling livestock at night reduces predation (Woodroffe et al., 2007a; Gusset et al., 2009). The park-adjacent communities mainly practice free range livestock keeping, which makes livestock ready prey for wildlife species.

5.2 Contributions and limitations of the research

The main academic findings of the study:

- Shows that cultural valuation of wildlife shape the way people interact with wildlife and the perception of wildlife impact. Culturally valued species are not eaten, killed or harmed and tolerated whereas the same species are considered as problematic in other communities.
- Reveals that communities closer to PAs particularly communities involved in tourism perceive wildlife impacts more positively than those farther away from PAs due to the benefits they derive or perceive from them. This finding contrasts with standard perceptions in the literature which states that communities closer to PAs mainly suffer from wildlife in the form of crop depredation and livestock attacks.
- Corroborates the findings that community participation in PA management such as CBNRM helps rural communities to tolerate the negative impacts of wild

animals because of the benefits they gain from wildlife or the perceived potential for gaining benefits (Jones and Murphree, 2004).

- Shows that observing proper entry protocols and engaging local residents ensures that respondents open up for research. Permission should be sought from traditional authorities as well as local village chiefs before research is carried out. Involving local native residents such as teachers solves language barrier challenges and also makes respondents receptive since teachers are well respected in rural communities.
- Provides methodological contribution in the form of qualitative insights. Although structured or semi-structured survey is excellent in sampling broader views from the society it should be complimented with qualitative survey. There is a rich source of information that can be obtained from informal qualitative approaches such as “hanging out” with the people, listening to stories, and interacting with the people. Rich information that comes from ethnographic responses helps to triangulate data obtained from structured surveys.

Limitations of the study:

Given that the study found considerable variability among the communities, the concentration of the study in ten out of the 33 communities around the park could have been extended to include more communities. Although the communities were selected to represent the variability of communities around Mole in terms of traditional affiliations, CREMA involvement, and distance from the park, there may be additional community characteristics that were not included.

5.3 Management implications and recommendations

Tourism in Mole has potential for expansion. The management should pursue the objectives of expansion according to the management plan. However, the expansion should be properly executed to protect the ecological integrity of the park. For example, core areas should be left intact to protect wildlife from intrusion. Also, tourism expansion in the park should be integrated with the nearby communities to provide economic benefits which offset the negative impacts of the park.

Park management should provide refresher training programs for tour guides to ensure tourists satisfaction. Messaging and interpretation have a great influence on tourist experiences. The tour guides provide the link between the park and tourist. Hence, the guide should be better equipped to meet the tourist's expectations.

Park management needs to intensify interventions during harvest season to minimize the effect of crop depredation which raises food security concerns and affects rural livelihoods. Communities within the zone of influence, those located very close to the park boundary suffer the brunt of conservation in terms of crop depredation and livestock attacks. It is imperative for park management to intensify measures to minimize this effect on local communities as a means of reducing poverty.

The park management should incorporate local indigenous knowledge in the form of cultural values such as totems and taboos in the management of human-wildlife issues. Culture and traditions are well respected by local communities and when conservation is built around these values, it engenders support from local communities. Cultural and traditional values make local communities even tolerate problem wildlife species to help meet conservation outcomes.

Park-adjacent communities should practice semi-intensive livestock rearing to minimize attacks from wildlife on free ranging livestock. The literature suggests that free ranging livestock are at the mercy of carnivores in park-adjacent communities (Namgail et al., 2007). Putting livestock in pens especially during the night when there are no people around, minimizes attacks by wildlife.

Farming very close to the park boundary should be discouraged and when it becomes necessary to farm near the boundary, farmers should cultivate crops that do not attract wildlife. Farming close to the PA boundary predisposes farms to raids by wildlife. Where land availability is an issue, crops that do not attract wildlife should be considered. Money raised from the sales of such crops can be used to purchase staples that cannot be grown because of wildlife.

5.4 Future research

The study has raised several areas where future research is required:

1. PAs may have an overall positive impact on some adjacent communities; however, poverty still exists in PA-adjacent communities. There is a need for more research into the causes of poverty in PA-adjacent communities and how this can be mitigated.
2. Also given the apparent contradiction between overall attitudes and specific attitude shown in this study, there is the need for more theoretical research into such contradiction in the adjacent communities.
3. As Mole National Park seeks to develop and expand tourism, there is the need for continual monitoring of the impacts of tourism to ensure long term sustainability.
4. Given the variability among the communities, there is the need for more research into appropriate approaches for tourism development in PA-adjacent communities.

5.5 Concluding remarks

To resolve the conservation and development conundrum, conservation approaches must deal with the dilemma that solutions are required for both biodiversity and people. Properly developed nature-based tourism in and around PAs can serve both conservation and development outcomes. However, the success of PAs as a conservation strategy depends to some extent on the support of the nearby communities. Tourism resource analysis is required. For example in the Mole situation there is the need to choose which communities/villages get benefits. Villages with tourism potential in terms of products and services to offer tourists, accessibility, CREMA involvement, and leadership should be assisted with appropriate approaches for tourism development.

Park-adjacent community perception of concerns and benefits and the valuation of wildlife are important in the conservation process. Social exchange theory was supported in this study. When people get benefits they are more likely to put up with concerns. Therefore, efforts should be made to ensure that concerns do not outweigh the benefits of

living near PAs to ensure support for conservation. Tourism development in PAs should benefit nearby communities to offset the negative impact of PAs on adjacent communities.

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Appendix A: Ethics Certificate



University
of Victoria

Human Research Ethics Board
Office of Research Services
Administrative Services Building
PO Box 1700 STN CSC
Victoria British Columbia V8W 2Y2 Canada
Tel 250-472-4545, Fax 250-721-8960
Email ethics@uvic.ca Web www.research.uvic.ca

Certificate of Approval

PRINCIPAL INVESTIGATOR	Emmanuel Acquah	ETHICS PROTOCOL NUMBER	11-383
UVic STATUS:	Ph.D. Student	ORIGINAL APPROVAL DATE:	02-Nov-11
UVic DEPARTMENT:	GEOG	APPROVED ON:	02-Nov-11
SUPERVISOR:	Phil Dearden	APPROVAL EXPIRY DATE:	01-Nov-12
PROJECT TITLE: Human-Wildlife Interaction, Nature-Based Tourism and Protected Areas Management: The Case of Mole National Park and the Adjacent Communities in Ghana			
RESEARCH TEAM MEMBERS: Enock Ashie, Advisory (Deputy Park Manager, Mole National Park)			
DECLARED PROJECT FUNDING: IDRC			
CONDITIONS OF APPROVAL			
This Certificate of Approval is valid for the above term provided there is no change in the protocol.			
Modifications			
To make any changes to the approved research procedures in your study, please submit a "Request for Modification" form. You must receive ethics approval before proceeding with your modified protocol.			
Renewals			
Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Renewal" form before the expiry date on your certificate. You will be sent an emailed reminder prompting you to renew your protocol about six weeks before your expiry date.			
Project Closures			
When you have completed all data collection activities and will have no further contact with participants, please notify the Human Research Ethics Board by submitting a "Notice of Project Completion" form.			
Certification			
This certifies that the UVic Human Research Ethics Board has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Participants.			
 Dr. Rachael Scarth Associate Vice-President, Research			

Certificate Issued On: 02-Nov-11

11-383
Acquah, Emmanuel

Appendix B: Research Permit



FORESTRY COMMISSION (WILDLIFE DIVISION)

P. O. BOX MB 239 ACCRA, GHANA
 TEL: (233- 21) 401210/ 401227/ 401216/ 401231/ 401249
 FAX: (233- 21) 401179
 E-MAIL: info_wd@hq.fcghana.com

WD/A.30/VOL.6/37

AUGUST 11, 2011

MR EMMANUEL ACQUAH (PhD CANDIDATE)
 DEPARTMENT OF GEOGRAPHY
 UNIVERSITY OF VICTORIA
 P.O. BOX 3060 STN.CSC
 VICTORIA, BC
 V8W 3R4
 CANADA.

Dear Sir,

**RE: APPLICATION FOR PERMIT TO CONDUCT RESEARCH IN AND
 AROUND MOLE NATIONAL PARK: MR EMMANUEL ACQUAH (PhD)**

We write to acknowledge receipt of your letter dated August 5, 2011 on the above subject matter.

This is to inform you that you have been granted permission to conduct research on *“Human-Wildlife Interactions, Nature-Based Tourism And Protected Areas Management” in Mole National Park and its fringing communities from October 2011 to August 2012.* Though this permission is gratis, you will have to pay for park entry and guide fees.

Also, you are required to submit two (2) copies of the report to this Office as well as any publication resulting from the research.

By a copy of this letter, the Manager in – charge of the Park is directed to give you the needed assistance to make your study successful while ensuring all regulations regarding wildlife protected areas are observed.

Thank you for your customary cooperation.

Yours faithfully,


 for : EXECUTIVE DIRECTOR
 J.Y.OPPONG
 (ASSIST.PR MANAGER)

CC.
 THE MANAGER
 MOLE NATIONAL PARK
 DAMONGO – N/R.

Appendix C: Letter of Consent for the Participants



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of Victoria



Human-Wildlife Interactions, Nature-based Tourism and Protected Areas Management

You are invited to participate in a study entitled: “Human-Wildlife Interactions, Nature-Based Tourism and Protected Areas Management: The Case of Mole National Park and the Adjacent Communities in Ghana”

This study seeks to examine human-wildlife interactions in Mole National Park and the adjacent communities to generate knowledge on the distribution, dynamics, and impacts on park community, tourists, and adjacent communities. The study will also explore implications of the interactions for the growing tourism industry and protected areas management.

The researcher guarantees that all information collected from you will be kept confidential and you are assured of anonymity through coding in entering information into the research database. No other persons will use the data other than the researcher for the purpose of this study. The data will be disposed of by erasing electronic data and shredding paper copies after completion of the research. There are no known or anticipated risks to you by participating in this research. Your participation is completely voluntary, and you may withdraw at any time without any explanation. Participation in this research is either: interviews 45-90 minutes long; focus group meetings 2-3 hours long; or completing a questionnaire 30-60 minutes long.

Results from this study will form part of a PhD dissertation, may be published in academic journals, presented in academic conferences, and be published online. The research is part of Protected Areas and Poverty Reduction (PAPR) project and is being conducted by University of Victoria, Canada and Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. If you are interested in the summary of the results you can visit www.papr.co.ca by September, 2013. If you have any questions you can contact the principal researcher at eacquah@uvic.ca or 020-8165513. In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-45450 or ethics@uvic.ca)

Your participation means free and informed consent is implied and indicates that you understand the above conditions of participation in this study.

Participant’s signature or verbal consent: Date.....

Thanks for your help,
Emmanuel Acquah

Appendix D: Key Informant Interview Guide

Introduction

My name is Emmanuel Acquah, a PhD Candidate from University of Victoria, BC Canada and a Lecturer at Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. I am working on my PhD research; “Human-Wildlife Interactions, Nature-based Tourism and Protected Areas Management: The Case of Mole National Park and the Adjacent Communities in Ghana”. The study is part of Protected Areas and Poverty Reduction (PAPR) project.

This study seeks to examine human-wildlife interactions in Mole National Park and the adjacent communities to generate knowledge on their distribution, dynamics, and impacts on park community, tourists, and adjacent communities. The study will also explore implications of the interactions for the growing tourism industry and protected areas management.

In the next 45-90 minutes, if you would not mind, I would like to conduct interview with you about your thoughts, stories, and experiences related to the research topic. Please take the time that you need to answer my questions.

Please keep in mind that your participation in this study is completely voluntary and that all of your responses from the interview will remain confidential. Your personal information will not be put into any report and you are assured of anonymity through coding in entering information into the research database.

Permission to proceed

Do you have any questions? If it is alright with you I will like to begin.

QUESTIONS

Views about human-wildlife interactions

1. Have you ever had an encounter with wildlife?
2. What are your views about the way humans relate with wildlife?

Human-wildlife interactions and nature-based tourism

3. What are the motivations for tourists visiting Mole National Park?
4. How does wildlife impact on tourists?
5. How does guided tours influence tourists experience at Mole?

6. How can adjacent communities tap into tourism at Mole?

Concerns and benefits of living near Mole National Park

7. What are the perceived concerns and benefits living near the park?

8. What are the factors that explain the differences in concerns and benefits of living near the park?

Impacts of wildlife on adjacent communities?

9. What are the impacts of wildlife on adjacent communities?

10. How does cultural evaluation of wildlife shape the behaviour of people towards wildlife?

That's all I have for the interview unless there is anything else you would like to add.

Thank you for agreeing to have an interview with me today.

Appendix E: Focus Group Meetings Guide

Introduction

Welcome and thank you for taking time off your schedule to be here for the meeting. My name is Emmanuel Acquah, a PhD Candidate from University of Victoria, BC Canada and a Lecturer at Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. I am working on my PhD research; “Human-Wildlife Interactions, Nature-based Tourism and Protected Areas Management: The Case of Mole National Park and the Adjacent Communities in Ghana”. The study is part of Protected Areas and Poverty Reduction (PAPR) project.

This study seeks to examine human-wildlife interactions in Mole National Park and the adjacent communities to generate knowledge on their distribution, dynamics, and impacts on park community, tourists, and adjacent communities. The study will also explore implications of the interactions for the growing tourism industry and protected areas management.

In the next 2-3 hours, if you would not mind, I would like to have a discussion with you about your thoughts, stories, and experiences related to the research topic. I will be facilitating the meeting by asking questions. Please everyone is allowed to respond to the questions. There is no right or wrong answer. Please if someone is making a contribution, allow him/her to finish before you make yours.

Please keep in mind that your participation in this study is completely voluntary and that all of your responses from the discussion will remain confidential. Your personal information will not be put into any report and you are assured of anonymity through coding in entering information into the research database.

Permission to proceed

Do you have any questions? If it is alright with you I will like to begin.

QUESTIONS

Views about human-wildlife interactions

1. What experience have any of you had with wildlife?
2. What are your views about the way humans relate with wildlife?

Human-wildlife interactions and nature-based tourism

3. What are the motivations for tourists visiting Mole National Park?
4. How does wildlife impact on tourists?
5. How does guided tours influence tourists experience at Mole?
6. How can adjacent communities tap into tourism at Mole?

Concerns and benefits of living near Mole National Park

7. What are the perceived concerns and benefits living near the park?
8. What are the factors that explain the differences in concerns and benefits of living near the park?

Impacts of wildlife on adjacent communities?

9. What are the impacts of wildlife on adjacent communities?
10. How does cultural evaluation of wildlife shape the behaviour of people towards wildlife?

Strategies to enhance and mitigate interactions

11. How can park management help improve human-wildlife issues?
12. How can this community live harmoniously with wildlife?
13. What strategies can be taken to enhance positive interactions and mitigate negative interactions? Finally,

That's all I have for the meeting unless there is anything else anybody would like to add.

Thank you for participating in this discussion.

Appendix F: Tourists Survey



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This survey concerns your views about human-wildlife interactions in Mole National Park. It forms part of a PhD research entitled “*Human-Wildlife Interactions, Nature-Based Tourism and Protected Areas Management: The Case of Mole National Park and the Adjacent Communities in Ghana*”.

Experience in Mole National Park

Q1. About how many times have you visited Mole National Park in the past? (Please circle number)

1. Not At All
2. Once
3. 2 To 3Times
4. 4 To 5 Times
5. More Than 5 Times

Q2. How did you hear about Mole National Park? (Please circle all that apply)

1. From a travel book
2. From the internet
3. From TV
4. From a travel agent
5. From a friend
6. From a family member
7. From other (please specify:_____)

Motivations for visiting the park

Q3. How important were each of the following reasons for visiting Mole? (Please circle number beside each statement)

	Not at all Important	Somewhat Important	Not Sure	Very Important	Extremely Important
A. Seeing wildlife	1	2	3	4	5
B. Enjoying the views	1	2	3	4	5
C. Being close to nature	1	2	3	4	5
D. Learning about wildlife and nature	1	2	3	4	5
E. Having an adventure	1	2	3	4	5

F. Experiencing and learning about another culture	1	2	3	4	5
G. Doing something with family/friends	1	2	3	4	5
H. Relaxing	1	2	3	4	5
I. Getting away	1	2	3	4	5

Q4. Is there any other reason for this visit to Mole? Please describe briefly below.

Satisfaction with Your Experience at Mole National Park

Q5. How satisfied are you with the following aspects of your experience at Mole National Park?

	Very Unsatisfied	Somewhat Unsatisfied	Not Sure	Somewhat Satisfied	Very Satisfied
A. Seeing elephants	1	2	3	4	5
B. Seeing birds	1	2	3	4	5
C. Seeing other wildlife	1	2	3	4	5
D. Behaviour of wildlife	1	2	3	4	5
E. Seeing natural environment	1	2	3	4	5
F. Accommodation	1	2	3	4	5
G. Food services in the park	1	2	3	4	5
H. Travel to the park	1	2	3	4	5
I. Nature guide/tour guide	1	2	3	4	5
J. Quality of trails	1	2	3	4	5
K. Signage in the park	1	2	3	4	5
L. Viewing platforms	1	2	3	4	5
M. Visitor/information center	1	2	3	4	5
N. Weather	1	2	3	4	5
O. Numbers of other tourists	1	2	3	4	5
P. Behaviour of other tourists	1	2	3	4	5

Q. Safety in the park environment	1	2	3	4	5
R. Friendliness of park staff	1	2	3	4	5
S. Friendliness of motel staff	1	2	3	4	5
T. Park entrance fee	1	2	3	4	5

Q6. Please indicate the extent to which seeing the following wildlife enhanced or detracted from your experience at Mole National Park.

	Strongly Detracted	Somewhat Detracted	Neither/ Not Sure	Somewhat Enhanced	Strongly Enhanced
A. Elephants	1	2	3	4	5
B. Baboons	1	2	3	4	5
C. Warthogs	1	2	3	4	5
D. Monkeys	1	2	3	4	5
E. Antelopes	1	2	3	4	5
F. Birds	1	2	3	4	5
G. Crocodiles	1	2	3	4	5
H. Snakes	1	2	3	4	5
I. Scorpions	1	2	3	4	5
J. Insects	1	2	3	4	5

Q7. Can you think of any other animals in Mole that enhance or detract from your experience at Mole National Park? Please describe these interactions in the space below.

Guided tour experience

Q8. If you participated in a guided tour at Mole led by park staff, please indicate how satisfied you felt about the performance of the guided tour.

	Very Unsatisfied	Somewhat Unsatisfied	Not Sure	Somewhat Satisfied	Very Satisfied
A. The length of the walk	1	2	3	4	5
B. Physical difficulty of the walk	1	2	3	4	5
C. Wildlife seen on the walk	1	2	3	4	5

D. Other things seen on the walk	1	2	3	4	5
E. Safety of the walk	1	2	3	4	5
F. Number of people in your group	1	2	3	4	5
G. Guide did not allow people to feed wildlife	1	2	3	4	5
H. Guide discussed reasons for not feeding wildlife	1	2	3	4	5
I. Overall organization of the walk	1	2	3	4	5
J. Guide's knowledge of wildlife	1	2	3	4	5
K. Guide's knowledge of other park features	1	2	3	4	5
L. Guide's ability to create interest in the park	1	2	3	4	5
M. Guide's minimizing visitor impact on the park	1	2	3	4	5
N. Guide's discussion of local Ghanaian culture	1	2	3	4	5
O. Guide's control of group behavior	1	2	3	4	5

Q9. Listed below are some of the regulations about wildlife in Mole National Park. Please indicate how much you oppose or support each of the following.

	Strongly Oppose	Somewhat Oppose	Not Sure	Somewhat Support	Strongly Support
A. Not allowed to touch wildlife	1	2	3	4	5
B. Not allowed to get very close to wildlife	1	2	3	4	5
C. Not allowed to feed wildlife	1	2	3	4	5
D. Staying on designated trails	1	2	3	4	5

Q10. Are there any other regulations you would like to comment about?

Response to experiences at Mole National Park

Q11. Please indicate how much you agree or disagree with each of the following as a response to your experience at Mole National Park.

The experiences have:	Strongly Disagree	Somewhat Disagree	Not Sure	Somewhat Agree	Strongly Agree
A. Made the park very attractive to me	1	2	3	4	5
B. Made me think about visiting again	1	2	3	4	5
C. Made me willing to pay more entrance fees	1	2	3	4	5
D. Made me willing to do word of mouth promotion of the park	1	2	3	4	5
E. Inspired me to invest in park related tourism	1	2	3	4	5
F. Led to feeling of fear about wildlife	1	2	3	4	5
G. Led to appreciation of wildlife	1	2	3	4	5
H. Increased my support for conservation	1	2	3	4	5

Q12. Which of the following best describe your overall attitude toward wildlife in Mole National Park?

1. Very Positive
2. Somewhat Positive
3. Neither Positive or Negative
4. Somewhat Negative
5. Very Negative

A Little about You

Q13. Your gender:

1. Male
2. Female

Q14. Your nationality: _____

Q15. What is your main purpose of visiting Ghana? (For international tourist)

Q16. What is your age (please circle the appropriate number below)?

1. Under 18 Years
2. 18-25 Years
3. 26-35 Years
4. 36-45 Years
5. 46-55 Years
6. 56-65 Years
7. Over 65 Years

Q17. At this time are you employed?

1. Not At All
2. Part Time
3. Full Time

Q18. Is there anything else you would like to comment about Mole National Park?

Appendix G: Adjacent Community Survey



University
of Victoria



Q1. About how many times have you visited Mole National Park in the past? (Please circle number)

6. Not At All
7. 1 To 5 Times
8. 6 To 10 Times
9. 11 To 15 Times
10. More Than 15 Times

Impact of wildlife

Q2. Living near Mole National Park brings you within close contact with many wild animals. Please indicate the extent to which the following wild animals have enhanced or detracted from your experience of living near Mole.

	Strongly Detracted	Somewhat Detracted	Neither/ Not Sure	Somewhat Enhanced	Strongly Enhanced
A. Elephants	1	2	3	4	5
B. Baboons	1	2	3	4	5
C. Warthogs (bush-pigs)	1	2	3	4	5
D. Patas Monkeys	1	2	3	4	5
E. Vervet monkeys	1	2	3	4	5
F. Bushbucks	1	2	3	4	5
G. Waterbucks	1	2	3	4	5
H. Kobs	1	2	3	4	5
I. Hyenas	1	2	3	4	5
J. Leopards	1	2	3	4	5
K. Rats	1	2	3	4	5
L. Grass-cutters	1	2	3	4	5
M. Other Rodents	1	2	3	4	5

N. Parrots	1	2	3	4	5
O. Partridges	1	2	3	4	5
P. Other Birds	1	2	3	4	5
Q. Insects	1	2	3	4	5
R. Snakes	1	2	3	4	5
S. Scorpions	1	2	3	4	5

Q3. Can you think of any other animals in the park that enhance or detract from your experience of living near the Park? Please describe these interactions in the space below.

Concerns and benefits of living near Mole national park

Q4. Listed below are a number of possible concerns that can arise as a result of communities living near Mole National Park. Please indicate if you feel each of the following is a small concern, large concern, or not a concern.

	Not a Concern	Small Concern	Large Concern	Not Sure
A. Crop depredation by wild animals	1	2	3	4
B. Livestock attacks by wild animals	1	2	3	4
C. Pets attack by wild animals	1	2	3	4
D. Damage to infrastructure by wild animals	1	2	3	4
E. Wild animals attack on humans	1	2	3	4
F. Community members living in fear of wild animals	1	2	3	4
G. Disease transmission from wild animals to humans	1	2	3	4
H. Disease transmission from wild animals to livestock and pets	1	2	3	4
I. Illegal hunting (poaching) by community members	1	2	3	4
J. Destruction of environment through hunting	1	2	3	4
K. Loss of pasture to feed livestock	1	2	3	4
L. Loss of farm lands	1	2	3	4
M. Loss of access to the park to collect non	1	2	3	4

timber forest products

N. Loss of access to the park to perform religious/traditional rituals to gods located in the park	1	2	3	4
O. Culture adulteration by tourists who visit the community	1	2	3	4
P. Tourists intruding into private lives of community members	1	2	3	4
Q. Decreased support for conservation	1	2	3	4

5. Are there any other concerns you have about living near to Mole National Park? Please state them in the space provided.

—

Q6. From the concerns listed above in **Q4** please indicate which ones are the most important to you. Place the appropriate letters from **Q4** in the spaces provided below, in order of importance.

__ Most Important __ Second Most Important __ Third Most Important

Q7. Listed below are a number of possible benefits that nearby communities derive from Mole National Park. Please indicate if you feel each of the following is a small benefit, a large benefit, or not a benefit.

Living near Mole National Park has:	Not a Benefit	Small Benefit	Large Benefit	Not Sure
A. Increased visitation and overnight stay in this community	1	2	3	4
B. Provided more business opportunities for this community	1	2	3	4
C. Resulted in improved infrastructure in this community (e.g. roads)	1	2	3	4
D. Increased recreational activities for residents in the community	1	2	3	4
E. Increased conservation awareness of the community	1	2	3	4
F. Provided ecosystem services (e.g. clean air, water)	1	2	3	4
G. Provided the community members with bush-meat	1	2	3	4
H. Helped maintain cultural identity of the community	1	2	3	4
I. Provided religious/spiritual benefits	1	2	3	4
J. Attracted people to live in this community	1	2	3	4

Q8. Are there any other benefits to you for living near to Mole National Park? Please state them in the space provided.

Q9. From the benefits listed above please indicate which ones are the most important to you. Place the appropriate letters from **Q8** in the spaces provided below, in order of importance.

___ Most Important ___ Second Most Important ___ Third Most Important

Q10. Considering the concerns and the benefits mentioned above, how do you feel about living near Mole National Park?

1. The cost (negative interactions) strongly outweighs the benefits (positive interactions)
2. The cost (negative interactions) somewhat outweighs the benefits (positive interactions)
3. The cost (negative interactions) about equal to the benefits (positive interactions)
4. The benefits (positive interactions somewhat outweighs the cost (negative interactions)
5. The benefits (positive interactions) strongly outweighs the cost (negative interactions)

Q11. Which of the following best describe your overall attitude toward living near Mole National Park?

- 1 Very positive
- 2 Somewhat positive
- 3 Neither positive or negative
- 4 Somewhat negative
- 5 Very negative

Q12. Are there any wild animals that are tabooed in this community? Please list them in the space provided.

Strategies to enhance positive interactions and mitigate negative interactions

Q13. Listed below are a number of possible ways that positive human-wildlife interactions can be enhanced and negative ones mitigated in this community. Please how effective are each of the following?

	Not at all Effective	Low Effectiveness	Medium Effectiveness	High Effectiveness
A. Park rangers should patrol the park boundary	1	2	3	4
B. Leaving a parcel of community land as a buffer between the park boundary and the community	1	2	3	4
C. Not clearing forest near water bodies to attract wild animals for tourist and community viewing	1	2	3	4
D. Building viewing platforms in places where wild animals are seen	1	2	3	4
E. Guarding farms to prevent wildlife raiding	1	2	3	4
F. Pepper grease fence to prevent farm raiding by elephants	1	2	3	4
G. Scaring/frightening wildlife away by making loud noise	1	2	3	4
H. Using scarecrow to drive away wild animals	1	2	3	4
I. Keeping livestock in pens	1	2	3	4
J. Avoid growing crops that attract wild animals near the community	1	2	3	4
K. Not farming very close to the park boundary	1	2	3	4

Q14. Are there other ways to enhance human-wildlife interactions? Please state them in the space provided.

Q15. From the list in **Q13**, please indicate the three most effective approaches. Place the appropriate letters from **Q13** in the spaces provided below in order of effectiveness.

___ Most Effective ___ Second Most Effective ___ Third Most Effective

Q16. Which of the following best describe your overall attitude toward wildlife?

1. Very positive
2. Somewhat positive
3. Neither positive or negative
4. Somewhat negative
5. Very negative

Community's perception of tourism

Q17. Listed below are some of the ways that communities living near Mole National Park can take advantage of their location and human-wildlife interactions through tourism. How good or bad do you feel about each?

	Very Bad	Somewhat Bad	Not Sure	Somewha t Good	Very Good
A. Marketing the community as a tourism destination	1	2	3	4	5
B. Organize cultural performances to attract tourists	1	2	3	4	5
C. Provide homestay for tourists	1	2	3	4	5
D. Organize community tour for tourists	1	2	3	4	5
E. Organize farm tour for tourists	1	2	3	4	5
F. Show case other attractive features of the community (e.g. unique landscape)	1	2	3	4	5

Q18. Are there other ways to have your community develop tourism businesses? Please state them in the space provided.

A Little about You

Q19. Community's name: _____

Q20. Language group/ethnicity _____

Q21. How many years have you live in this community? ____years

Q22.What is your age (please circle the appropriate number below)?

1. Under 18 years
2. 18-25 years
3. 26-35 years
4. 36-45 years
5. 46-55 years
6. 56-65 years
7. Over 65years

Q23. Gender:

1. Male
2. Female

Q24. At this time are you employed?

1. Not at all
2. Part time (please specify type of job)
3. Full time (please specify type of job)

Q25. To what extent is your work related to the park?

1. Not at all
2. Somewhat related to the park
3. Highly related to the park

Q26. To what extent is your work related to tourism?

1. Not at all
2. Somewhat related to tourism
3. Highly related to the tourism

Q27. How have you been involved with Mole National Park? (Please circle all that apply)

1. Listened to a radio programme about the park
2. Attended a public meeting about the park
3. Reported crop and livestock depredation to the park before
4. Arrested as a poacher before
5. A family member or relation works in the park
6. Employed by the park
7. Not at all involved or interested

Q28. Do you have any other comments or suggestions you will like to make?

Thank you for completing this questionnaire

Appendix H: The List of Animals in Mole National Park

Common name	Scientific name	Status
93 known mammals including		
Primates		
Black and white colobus	<i>Colobus vellerosus</i>	Rare
Anubis baboon	<i>Papio anubis</i>	Common, widespread
Vervet monkey	<i>Cercopithecus aethiops tantalus</i>	Common, widespread
Patas monkey	<i>Erythrocebus patas</i>	Common, widespread
Senegal galago	<i>Galago senegalensis</i>	Very common, widespread
Insectivora		
West African Hedgehog	<i>Atelerix albiventris</i>	Uncommon
Lagomorpha		
Scrub hare	<i>Lepus saxatilis</i>	Uncommon, widespread
Rodentia		
Striped ground squirrel	<i>Euxerus erythropus</i>	Common, widespread
Fire-footed rope squirrel	<i>Funisciurus pyrropus</i>	Uncertain record
Gambian sun squirrel	<i>Heliosciurus gambianus</i>	Common, widespread
Crested porcupine	<i>Hystrix cristata</i>	Widespread
Marsh cane rat	<i>Thryonomys swinderianus</i>	Common, widespread
Giant rat	<i>Cricetomys gambianus</i>	Uncertain
Carnivora		
Side-striped Jackal	<i>Canis adustus</i>	Occasional reports
Honey badger	<i>Mellivora capensis</i>	Unconfirmed reports
Gambian mongoose	<i>Mungos gambianus</i>	Common
Slender mongoose	<i>Galerella sanguinea</i>	Probably widespread, common
Marsh mongoose	<i>Atilax paludinosus</i>	Common
White tailed mongoose	<i>Ichneumia albicauda</i>	Uncommon
Spotted Hyena	<i>Crocuta crocuta</i>	Uncommon – but widespread
Genet	<i>Genetta sp</i>	Common, widespread
Civet	<i>Viverra civetta</i>	Probably widespread
Serval	<i>Felis serval</i>	Reports in 1970s only

Caracal	<i>Felis caracal</i>	Unconfirmed reports only
Leopard	<i>Panthera pardus</i>	Probably widespread
Lion	<i>Panthera leo</i>	Uncertain, occasional records
Pholidota		
Giant pangolin	<i>Smutsia gigantea</i>	Rare – only record is scales found in a lion dung, 1993
Tubulidentata		
Aardvark	<i>Orycteropus afer</i>	Common, widespread
Hyracoidea		
Rock Hyrax	<i>Procavia capensis</i>	Heard and seen on Konkori escarpment
Proboscidea		
Elephant	<i>Loxodonta africana</i>	Common, - southern lowlands
Artiodactyla		
Hippopotamus	<i>Hippopotamus amphibius</i>	Occasional visitors to Kulpawn river
Warthog	<i>Phacochoerus aethiopicus</i>	Common, widespread
Buffalo	<i>Syncerus caffer</i>	Common, widespread
Bushbuck	<i>Tragelaphus scriptus</i>	Common, widespread
Bush (Grey) duiker	<i>Sylvicapra grimmia</i>	Common, widespread
Red-flanked duiker	<i>Cephalophus rufilatus</i>	Common – wetter areas
Yellow-backed duiker	<i>Cephalophus silvicultor</i>	Occasional reports - uncommon
Oribi	<i>Ourebia ourebi</i>	Common, widespread
Roan antelope	<i>Hippotragus equinus</i>	Fairly common, widespread
Kob (Buffon's kob)	<i>Kobus kob</i>	Common, near rivers
Defassa waterbuck	<i>Kobus ellipsiprymnus defassa</i>	Common, near rivers
Hartebeest (Western Red)	<i>Alcelaphus buselaphus</i>	Common, widespread
344 listed birds species including		
Abyssinian ground horn bill	<i>Bucorvus abyssinicus</i>	
Martial Eagle	<i>Polemaetus bellicosus</i>	
White headed vulture	<i>Trigonoceps occipitalis</i>	
Saddle-billed Stork	<i>Ephippiorhynchus senegalensis</i>	
Marabou Stork	<i>Leptoptilos crumeniferus</i>	
Abyssinian roller	<i>Coracias abyssinicus</i>	
Violaceous plantain eater	<i>Musophaga violacea</i>	
Cattle Egret	<i>Bubulcus ibis</i>	

Red-throated bee-eater	<i>Merops bullocki</i>	
33 known reptiles including		
Agama lizard	<i>Agama agama</i>	
Sudan plated lizard	<i>Gerrhosaurus major</i>	
Brook's house gecko	<i>Hemidactylus brookii</i>	
African wall gecko	<i>Tarentola epphippiata</i>	
Skink	<i>Trachylepis perrotetii</i>	
Rainbow skink	<i>Trachylepis quinquetaeniata</i>	
Savannah monitor lizard	<i>Varanus exanthematicus</i>	
Slender snouted crocodile	<i>Crocodylus cataphractus</i>	
Nile crocodile	<i>Crocodylus niloticus</i>	
Royal python	<i>Python regius</i>	
Common bush snake	<i>Philothamnus irregularis</i>	
Elegant sand racer	<i>Psammophis elegans</i>	
Blind snake	<i>Leptotyphlops sp.</i>	
Spitting cobra	<i>Naja nigricollis</i>	
African side-necked turtle	<i>Pelusios sp</i>	
List of Amphibians		
Savannah banana frog	<i>Afrivalus vittiger</i>	
Galam white-lipped frog	<i>Amnirana galamensis</i>	
Hallowell's toad	<i>Bufo maculatus</i>	
Toad	<i>Bufo pentoni</i>	
Crowned Bullfrog	<i>Hoplobatrachus occipitalis</i>	
	<i>Hyperolius nitidulus</i>	
Brown running frog	<i>Kassina fusca</i>	
Rusty forest tree frog	<i>Leptopelis viridis</i>	
River frog	<i>Phrynobatrachus accraensis</i>	
Boutry river frog	<i>Phrynobatrachus calcaratus</i>	
West African rubber frog	<i>Phrynomantis microps</i>	
	<i>Ptychadena schubotzi</i>	
Broad-banded grass frog	<i>Ptychadena bibroni</i>	
Madine grassland frog	<i>Ptychadena pumilio</i>	
56 species of butterflies		

Scientific Name	Scientific Name	
Papilionidae	Danainae	
* <i>Papilio demodocus</i>	* <i>Danaus chrysippus</i>	
* <i>Graphium angolanus</i>	Charaxinae	
Pieridae	+ <i>Charaxes varanes</i>	
* <i>Catopsilia florella</i>	* <i>Charaxes epijasius</i>	
* <i>Eurema hecabe</i>	* <i>Charaxes achaemenes</i>	
* <i>Eurema regularis</i>	+ <i>Charaxes viola</i>	
* <i>Eurema brigitta</i>	+ <i>Charaxes plantroui</i>	
* <i>Colotis euipe</i>	Nymphalinae	
* <i>Colotis evagore</i>	* <i>Phalanta phalantha</i>	
+ <i>Colotis antevippe</i>	* <i>Euphaedra cyparissa</i>	
+ <i>Belenois aurota</i>	* <i>Euphaedra janetta</i>	
* <i>Belenois creona</i>	* <i>Hamanumida daedalus</i>	
* <i>Belenois subeida</i>	* <i>Neptis kiriakoffi</i>	
+ <i>Mylothris aburi</i> (Larsen ms.)	* <i>Neptis morosa</i>	
Lycaenidae	* <i>Neptis serena</i>	
+ <i>Myrina silenus</i>	* <i>Byblia anvatarata</i>	
+ <i>Myrina subornatus</i>	+ <i>Hypolimnas misippus</i>	
+ <i>Iolaus scintillans</i>	+ <i>Junonia oenone</i>	
+ <i>Iolaus ismenias</i>	+ <i>Junonia orithyia</i>	
+ <i>Stugeta marmoreus</i>	* <i>Junonia hierta</i>	
* <i>Hypolycaena philippus</i>	* <i>Junonia chorimene</i>	
* <i>Hypomyrina nomion</i>	* <i>Junonia terea</i>	
* <i>Deudorix antalus</i>	+ <i>Junonia ceryne</i>	
+ <i>Deudorix dinochares</i>	+ <i>Precis octavia</i>	
+ <i>Anthene amarah</i>	+ <i>Precis archesia</i>	
+ <i>Anthene lunulata</i>	+ <i>Vanessa cardui</i>	
* <i>Anthene talboti</i>	Acraeinae	
* <i>Anthene larydas</i>	+ <i>Acraea neobule</i>	
* <i>Anthene crawshayi</i>	* <i>Acraea eponina</i>	
* <i>Pseudonacaduba sichela</i>	+ <i>Acraea pseudogina</i>	
* <i>Leptotes pirithous</i>	* <i>Acraea caecilia</i>	

+ <i>Leptotes jeanneli</i>	Hesperiidae	
+ <i>Leptotes babaulti</i>	+ <i>Gegenes niso</i>	
* <i>Tuxentius cretosus</i>	* <i>Eretis lugens</i>	
* <i>Tarucus ungemachi</i>	* <i>Sarangesa laelius</i>	
* <i>Zizeeria knysna</i>	+ <i>Sarangesa phidyle</i>	
* <i>Azonus jesous</i>	+ <i>Spialia spio</i>	
* <i>Azonus mirza</i>	+ <i>Spialia diomus</i>	
* <i>Azonus moriqua</i>	* <i>Spialia dromus</i>	
* <i>Eicochrysops hippocrates</i>	+ <i>Gomalia elma</i>	
* <i>Eicochrysops dudgeoni</i>	* <i>Prosopalpus styla</i>	
+ <i>Euchrysops osiris</i>	+ <i>Gorgyra minima</i>	
+ <i>Euchrysops malathana</i>	+ <i>Parosmodes axis</i>	
+ <i>Euchrysops albistriatus</i>	* <i>Platylesches moritili</i>	
* <i>Euchrysops jacksoni</i>	+ <i>Pelopidas thrax</i>	
+ <i>Chilades trochylus</i>	+ <i>Pelopidas mathias</i>	
Nymphalidae	+ <i>Borbo fanta</i>	
* <i>Ypthimomorpha itonia</i>	* <i>Borbo fatuellus</i>	
* <i>Melanitis leda</i>	* <i>Borbo gemella</i>	
* <i>Melanitis libya</i>	* <i>Borbo perobscura</i>	
* <i>Bicyclus vulgaris</i>	+ <i>Borbo holtzi</i>	
* <i>Bicyclus pavonis</i>	+ <i>Parnara monasi</i>	
+ <i>Bicyclus safitza</i>	+ <i>Gegenes pumilio</i>	
+ <i>Bicyclus angulosus</i>	+ <i>Gegenes hottentota</i>	
+ <i>Ypthima condamini</i>		
* <i>Ypthima vuattouxi</i>		