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Developing a livelihood: conservation model for the Kakamega Forest region, Kenya using experiences from Berchtesgaden National Park, Germany

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ABSTRACT

Active participation of local community of Kakamega Forest in conservation has rather been elusive. Conservation efforts directed at the Forest have resulted into more resource use restrictions instead of access. Furthermore, the community faces the threat of human-wildlife conflict. Achieving a resilient livelihood and active forest conservation among the Community has therefore been a challenge. Against this background, the study sought to develop a conservation model for the Kakamega Forest region using experiences from Berchtesgaden National Park, Germany. The study adopted emic and etic approaches. A variety of interview methods were used to gain the inside feelings of the respondents with regard to livelihoods and conservation experiences. The resulting data were identified, coded and patterns reported using thematic analysis. Results indicated that most of the livelihood strategies being used by the local community of Kakamega forest are small scale and have a weak link to tourism and conservation activities. On the contrary, results from Berchtesgaden National Park indicated a livelihood asset base which is strong, diversified and strongly linked to tourism. The model developed gives more understanding and insight into the often delicate balance between livelihoods and conservation.

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Livelihoods; sustainability; conservation; model; Kakamega forest; Berchtesgaden national park

1. Introduction

Over the years, protected area management has evolved from being conceptualized as repositories of scenic grandeur and recreational parklands to a focus on the protection of individual species as well as biosphere and specific ecosystems (Luisa et al., 2003). During the early stages of protected area management evolution, protectionist policies especially in developing countries disregarded the rights of local communities and also failed to meet conservation objectives (Hulme & Murphree, 2001). Livelihood-related threats and negative attitudes towards protected areas were advanced as major reasons for the failure of the protectionist conservation philosophy (Coad et al., 2008; Hecker, 2005; Namara & Nsabagasani, 2003; Saito, 2007). However, more recent paradigms of

protected area management have adopted a more integrative approach of conservation and development opportunities in which local communities are seen as co-managers of protected areas. The paradigmatic change in protected area management has been institutionalized in the Man and Biosphere programme and the World Conservation Strategy. In this line of thinking, conservationists have opted for a more “sustainable approach” where local people’s needs and their participation are taken into consideration in conservation campaigns (Wells & McShane, 2004). Thus, the survival of biodiversity remaining in the world depends largely on the willingness of local people to embrace and be involved in conservation (Campbell et al., 2003).

Involving local community of Kakamega Forest in conservation has been rather elusive and challenging. Conservation efforts directed at the Forest and especially the northern part have resulted in more resource use restrictions rather than access. Despite these restrictions, illegal use of forest resources continues among the Forest community. Furthermore, the local community members living close to the Forest (within five kilometres from the Forest) suffer as a result of human–wildlife conflict. Thus, the inter-relationship between the local community and protected area management is largely characterized by mutual mistrust and resentment; a situation which poses not only a serious threat to the community livelihoods but also Forest conservation.

1.1. Objectives and research questions

The overall objective of the study is to develop a livelihood-conservation model for the Kakamega Forest region using conservation experiences from Berchtesgaden National Park (BNP). Specifically, the study seeks to:

- (i) Identify the social and natural assets available to the people living in Kakamega Forest and Berchtesgaden National Park region
- (ii) Identify the legal and policy frameworks that regulate livelihoods, conservation and management of Kakamega Forest and Berchtesgaden National Park
- (iii) Analyse livelihood strategies and outcomes in Kakamega Forest and the Berchtesgaden National Park region
- (iv) Ascertain the nature of livelihood linkages between the Forest adjacent community and Kakamega Forest on one hand and people living in the Berchtesgaden region and Berchtesgaden National Park on the other
- (v) Develop a livelihood- conservation model for the Kakamega Forest region using conservation experiences from Berchtesgaden National Park

The following are the research questions of the study:

- (i) What are the social and natural assets available to the people living in Kakamega Forest and Berchtesgaden National Park region?
- (ii) What legal and policy frameworks regulate livelihood, conservation and management of Kakamega Forest and Berchtesgaden National Park?
- (iii) What are the livelihood strategies and outcomes of people living adjacent to Kakamega Forest region and Berchtesgaden National Park?

- (iv) What is the nature of livelihood linkages between Forest adjacent community and Kakamega Forest on one hand and the people living in the Berchtesgaden region and Berchtesgaden National Park on the other?
- (v) How best can the local community of Kakamega Forest meet their livelihoods while simultaneously participating in conservation?

1.2. Conceptual framework

‘Livelihood’ is a concept that creates a deeper understanding of the dimensions of poverty (Haan & Zoomers, 2005). The livelihood concept gained global recognition in almost the same period as the sustainable development concept. With the Brundtland Commission’s report, *our common future* in 1987, the term *sustainable development* and *sustainable livelihood* gained global prominence. The UN conference on Environment and Development in 1992 adopted ‘sustainable livelihoods’ in linking socio-economic and environmental concerns. Livelihoods revolve around the lives of local people. Understanding aspects of livelihoods is therefore vital to comprehending the effectiveness of the conservation and development policy interventions (Salafsky & Wollenberg, 2000). The dominant assumption by many conservation actors has always been that attempts to address community livelihood needs around biodiversity areas would automatically ease the process of achieving conservation aims (Ashley & Hussein, 2000) as it is perceived to counter threats to ecosystems at a given site (Salafsky et al., 2001; Salafsky & Wollenberg, 2000). Such an assumption cannot be verified without considering and understanding the dimensions of livelihoods and what they mean and imply for conservation.

1.2.1. Sustainable livelihood framework

This study adopted the Sustainable Livelihood Framework (SLF) – Department for International Development (1999). This framework has been widely used in the fields of rural and community development, tourism and conservation as well as forest management (Ashley & Hussein, 2000; Brocklesby & Fisher, 2003; Mazur & Stakhanov, 2008; Simpson, 2007; Turton, 2000). It is an approach that correctly applied would enhance the achievement of some of the United Nations’ 2030 Sustainable Development Goals (SDGs) especially those that relate to poverty, environment and food security.

2. Study area

2.1. Selecting the case studies

Although the two protected areas are not directly comparable as their management objectives and protected area status are different, Berchtesgaden National Park (BNP), Germany, was chosen for this study considering that as a protected area, it is part of a biosphere reserve; implying that it demonstrates a fairly well-balanced relationship between conservation activities on one hand and human resource use on the other. Furthermore, most developed countries such as Germany have made a shift from purely protectionist approaches to those that recognize and put into practice active participation of local people in conservation and management of protected areas. Germany also has a long history of managing the ancient rights of local people to access and use park

resources, while simultaneously meeting conservation objectives. Therefore, developed countries like Germany stand out as models that developing countries can look up to with a view of improving protected area management.

On the other hand, Kakamega Forest faces eminent conservation threat. Over the years, there has been intensive agricultural land use and high resource extraction from the Forest to cope with the increasing local human population. As a result, most of the once expansive tropical rainforest that stretched across Zaire, Uganda, and Kenya (Cords & Tsingalia, 1982; Kokwaro, 1988; Tsingalia, 1988) has been destroyed over the years, making the Forest the only remaining easternmost patch in Africa. Under these prevailing circumstances, neither the conservation objectives of Kakamega Forest nor the livelihoods of the local community can be guaranteed. Against this background, BNP was chosen to provide valuable conservation and management experiences for Kakamega Forest and the surrounding region.

2.1.1. Kakamega forest

Kakamega Forest (Refer to [Figure 1](#)) is the only remaining Eastern patch of the Guineo-Congolian rainforest that once stretched across Zaire, Uganda, and Kenya. The Rainforest exhibits a unique biodiversity and habitat rarity, which makes it a sanctuary for a remarkable diversity of plants, birds, insects and other forms of animal life not found anywhere else in Kenya. The Forest is also a source to several Rivers that drain into Lake Victoria (Ogutu, 1997, pp. 31–45). The high resource extraction together with intensive agricultural activities has caused deforestation of the Forest over the years. Consequently, there has been a loss of unique biodiversity such as montane forest birds (Birdlife International, 2018).

2.1.2. Berchtesgaden national park

With the establishment of Berchtesgaden at the beginning of twelfth century, tenant farmers began to settle in the region. The population of the farmers increased to the extent that the valleys could no longer provide for the numbers prompting some of the farmers to find other sources of livelihood, for example, wood-carving and salt-mining. The increase in human population went alongside with clearance of land for agriculture and further incursion onto the mountains, so that by the end of the eighteenth century, a large area of the forest land was being used for cattle grazing. These land uses, together with mining and hunting, have over the ages significantly changed the natural landscape of the area designated as Berchtesgaden National Park. In the third Reich, the area of Königssee faced a threat posed by mass tourism. As a result of these threats, there have been efforts aimed at protecting the biodiversity of the Park. Chief of Forestry and Nature Conservation, Hermann Göring, in the third Reich declared the area around the Königssee a special nature reserve.

In 1898, travel writer Heinrich Noë recommended preserving the Berchtesgadener Land as a “Yellowstone of the German Alps” (Zierl, 1980). The forest botanist Carl Freiherr von Tubeuf and the Association for the Protection of Alpine Flora and Fauna (Verein zum Schutz der Alpenpflanzen und -Tiere) proposed to designate a protected area around the Königssee. In 1910, the Plant Reserve (Pflanzenschongebiet) Königssee was established (Zierl, 1980).

After the Second World War, scholar and President of the German League for Nature and Environment, Hans Krieg, proposed the establishment of a National Park. From 1970

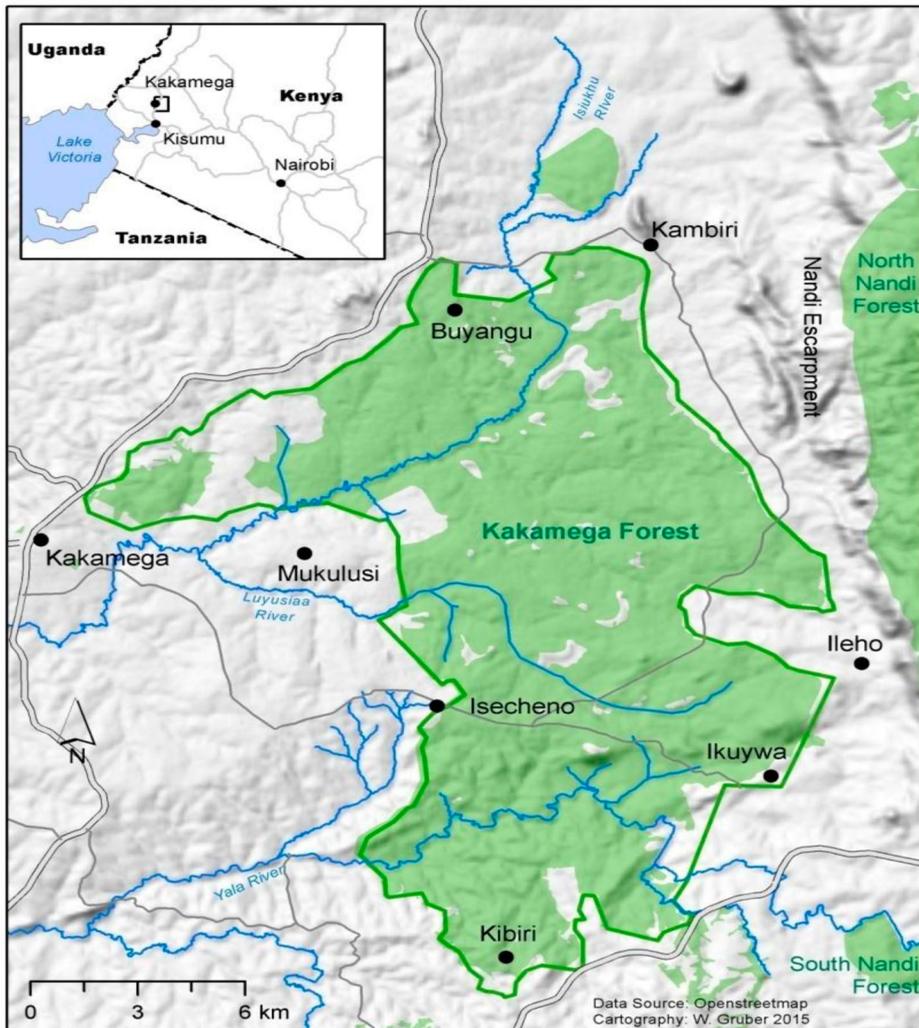


Figure 1. Kakamega Forest and Associated features. Source: Gruber ((2015).).

onwards, various German and Austrian conservation authorities and associations worked to create a joint National Park. Federal state authorities declared that this project was also intended to “ensure the development of the tourism sector” (Berchtesgadener Anzeiger, 1969). Tourism in the Berchtesgaden is not a recent activity. It has existed for several centuries, for example, St. Bartholomew’s church at Königssee has attracted pilgrims since the seventeenth century. The Bavarian royals chose Berchtesgaden as their summer residence to indulge in their hunting passion. The connection of Berchtesgaden to the railway network in 1888 instantly turned it into a popular destination for Alpine tourists and day trippers. However, modernization of tourism in the Berchtesgaden region brought controversy between conservationists and tourism practitioners. Anyone who did not believe in the economic necessity of the Watzmann cable car was accused of completely misjudging the gravity of the competitive situation (Müller, 1969). Attempts to modernize tourism accelerated plans to establish Berchtesgaden National Park. Berchtesgaden was

officially established as a National Park by a regulation of the Bavarian Parliament in 1978. Berchtesgaden National Park is an IUCN Category II protected area – dedicated to provide educational, recreational, and visitor options. In 1991, the United Nations designated the Berchtesgaden National Park region a UNESCO Biosphere Reserve and later (in 2010) extended the status to include the entire district of Berchtesgadener Land – See [Figure 2](#). The Biosphere Reserve is characterized by a variety of fauna and flora, such as corncrake (*Crex crex*), Eurasian curlew (*Numenius arquata*), scarce fritillary (*Euphydryas maturna*), southern damselfly (*Coenagrion mercuriale*), and golden eagle (*Aquila chrysaetos*) among other biodiversity.

The divide between conservationists and tourist practitioners that persisted in the early times no longer exists in the Park. Instead there is cooperation between the Park Management and tourist practitioners. However, the National Park brand has until recently only played a subordinate role in the highly developed, traditional destination of Berchtesgaden (Butzmann & Job, 2016). In the Park Management, protectionist

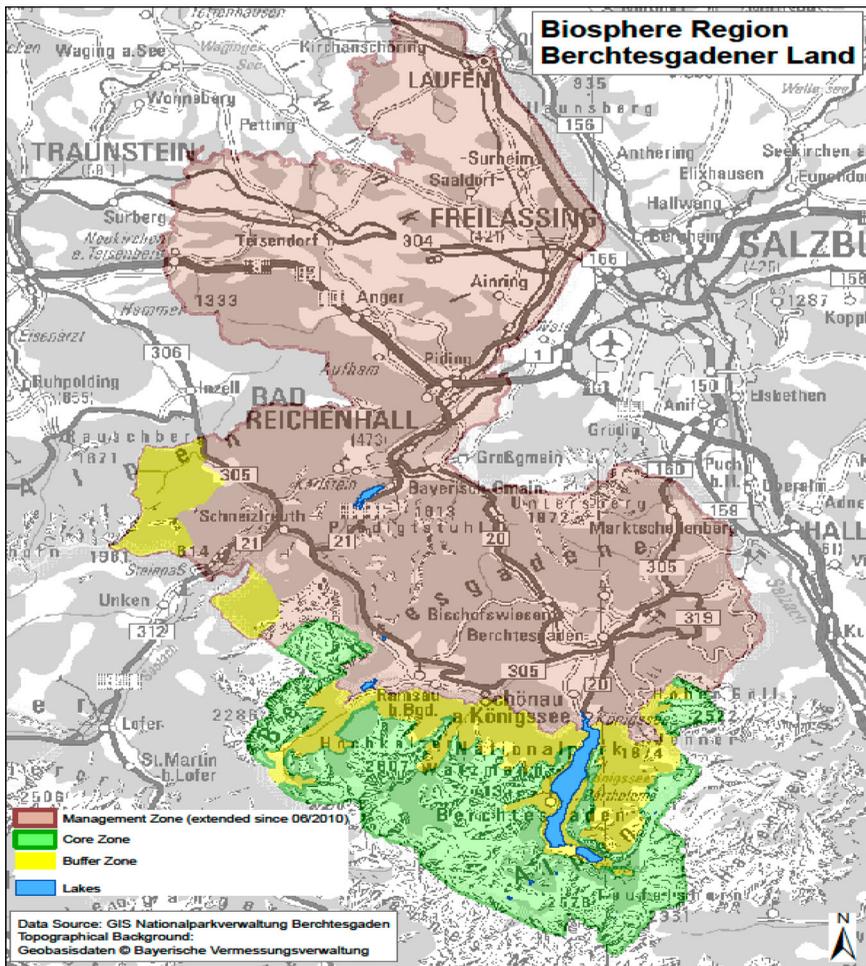


Figure 2. Biosphere region, Berchtesgadener Land. Source: GIS National Park Planning Berchtesgaden (2016).

approaches to conservation are not uniformly applied. This is illustrated in the management strategy adopted by the Park Management whereby in an attempt to protect existing biodiversity and reduce conflicting land uses, the Park management has developed three zones. The first and the largest (66.6%) is the core zone in which nature is left to itself, access is difficult and conflicting land use is minimal. The second zone is the permanent buffer or activity zone (23.5%) with a high degree of human interaction and impact. In this zone, the ancient rights held by local families still allow pasture and fishing. Other activities within the zone include heritage and cultural conservation as well as tourism. The third and final zone is the temporary buffer zone (9.9%). Management aims at restoring the zone to a more natural state and then adding it to core zone.

3. Research methodology

3.1. Methodological approaches

Emic and etic approaches were adopted for this study. The emic and etic terminology refers to basic approaches in cross-cultural studies. The terms involve both the cultural understandings of behaviour and the comparative analysis of these understandings. Pike, an anthropological linguist, developed the terms emics and etics, from the linguistic concept of phonemics and phonetics. He used the expressions as a way of discriminating between different types of data that are gathered in a study of cultural phenomenon. Pike suggested that the emic viewpoint results from studying behaviour from inside the system. Meanwhile the etic viewpoint studies behaviour from outside of a particular system (Pike, 1967). Harris (1968) modified Pike's definition. In Harris's view, emic statements refer to the logical systems whose discriminations are real and significant to the actors themselves, reflect the insider's beliefs, thoughts and attitudes. The emic approach assesses the insider's reported practices. In contrast, etic statements depend on distinctions judged as appropriate by scientific observers. They reflect the observer's formulation of the insider's thoughts and reactions and record the observer's analysis of the insider's action. Although some researchers view the two approaches as innately conflicting and emphasize one to the exclusion of the other (Fellepa, 1986), the idea that the two approaches are equally important, valuable and complimentary is more popular (Pike, 1967). Berry (1999) while supporting Pike's idea declared that both approaches are necessary to any developing social science field.

3.2. Adopting the emic and etic approaches in the study

In order to adopt the emic and etic approaches, this study uses a logical sequence as proposed by Berry (1999). The sequence starts with an etic then an emic approach and finally comes out with a derived etic approach. The study approach begins with identifying knowledge gaps through collection of relevant literature on conservation and livelihoods in Kakamega Forest and Berchtesgaden National Park region. This is done through literature review and forms the first part of the etic approach. It is followed by emic approach whereby the researcher gains the insiders' beliefs, thoughts and feelings about conservation and livelihoods through photo-elicitation interviews, in-depth interviews, and focus group discussions. The last part of the research procedure is a derived

etic approach whose purpose is to find out the nature of livelihoods and their linkages to conservation in Kakamega Forest and Berchtesgaden National Park respectively. This was achieved through qualitative analysis of data. The integration of emic and etic research approaches in this study is shown in [Figure 3](#).

3.3. Applying the livelihood framework in the study context

According to Department for International Development (DFID), the livelihood framework should be adapted to meet the needs of any given circumstance. Considering that both study areas are under some form of regulation and thus managed as protected areas, the study used the framework but only considered the following livelihood dimensions for in-depth study (Refer to [Table 1](#)).

3.3.1. Key informant in-depth interviews

This is a qualitative data gathering method that involves detailed interviewing of a select group of people who are chosen on the basis of their knowledge, understanding, or expertise on a subject. The purpose of such interviews is to collect information from a wide range of people, such as leaders of a community, professionals, and residents, who are familiar with the subject to be investigated. Although this method has a wide application, it is particularly appropriate when information is required for decision making as well as for recommendation. There are several types of interviews that fall within “in-depth interviewing”, ranging from free-form (or informal) conversations through semi-structured (or guided interviews) to standardized (or structured) interviews with a set of open-ended questions which are carefully worded and arranged. In this study, face to face semi-structured in-depth interview was used. This type of interview was chosen because it provided flexibility to explore, probe and finally ask specific questions. This enabled the researcher to make clarifications on areas that were not clear. The interviewer ensured that one-word response questions or those that lead to fit the researcher’s pre-conception were avoided. Instead, questions that permitted the informant to open up and express their feelings and ideas freely were considered. Thus, questions beginning with “What?” or “How?” were frequently used to open up the informant for detailed discussions. To enhance clarity, only one question was asked to the informant at a time. The questions were short and devoid of jargon. In-depth interviews were held with key informants from various institutions and representatives of the local community members. Key informants from the institutions were selected by virtue of their role, occupation, experiences, and knowledge in ecotourism and conservation issues in the Kakamega Forest region. According to these criteria, representatives from the following organizations were selected

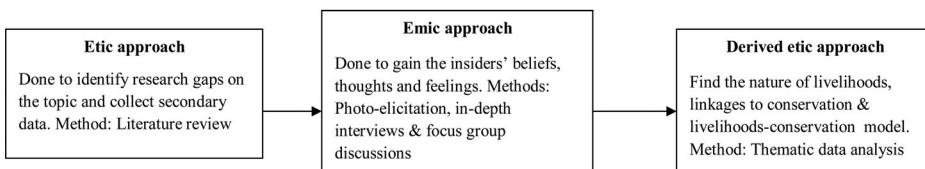


Figure 3. The integration of emic and etic research approaches. Source: Berry (1999) and adopted by the author

Table 1. Livelihood framework dimensions considered for the study.

Livelihood Dimension	Issues considered for the study
Social assets	✓ Membership of local people to groups or associations whose agenda is related to resource use, conservation and tourism.
Natural assets	✓ Resources that make up natural capital from intangible public goods such as fresh air, green environment and biodiversity to divisible assets used directly for production (trees, land, etc.).
Structures and processes	✓ Institutions, policies and legislation that regulate resource use and conservation in the Berchtesgaden National Park and Kakamega Forest region
Livelihood strategies	✓ Range, diversity and combination of livelihoods available to the local people of Berchtesgaden National Park and Kakamega Forest region
Livelihood outcomes: More income, Increased well-being and more sustainable use of natural resource base	✓ Availability of cash earned from livelihood activities undertaken by the local people; Non – material goods such as sense of control and inclusion; Access to services; Maintenance of culture and heritage; Sustainability of natural resources
Nature of livelihood linkages	✓ Analysed from the livelihood dimensions namely social, natural and strategies above

and interviewed: Community based organizations (CBO) working in the Forest, Protected Area Management (Forest officer and Kenya Wildlife Service Warden), Tour operators to Kakamega Forest, Local tour guides, Ecotourist facility operators in and Tour operators to Kakamega Forest, Ecotourism Kenya, and the Kenya Tourist Board.

3.3.2. Focus group discussions

According to Krueger and Cassey (2014), a focus group discussion is about listening to concerned stakeholders and gathering information on a defined topic in an informal open meeting situation. Compared with other qualitative research methods, focus groups have some advantages. Due to a non-formal, relaxed, and non-hierarchical free exchange of ideas, the method is able to determine the perceptions, feelings, and manner of thinking of participants (Krueger, 1994). Focus group discussions also fulfil social support function by allowing the participants to share their stories, concerns and wishes with others and develop a sense of solidarity with people who are going through similar experiences or have similar circumstances (Peek & Fothergill, 2009). In focus group discussion, the participants discuss specific issues, without necessarily reaching a consensus or making a decision on which course of action to take.

Based on their role, occupation, experiences, and knowledge in ecotourism and conservation issues in the Kakamega Forest, local community members residing within 3 kilometres from the Forest boundary and representing the five human settlement regions of Buyangu, Illeho, Kibiri, Ikuywa, and Isecheno (Refer to Figure 1) were selected for focus group discussions. Each group consisted of between 5 and 7 people. All respondents had attained a minimum of basic primary education. They are from various livelihood backgrounds, consisting mainly of farming and small scale business operations. The respondents were in the age range 45–70 years. On overall, 55 percent males and 45 percent females ($n = 36$) were selected as participants. The discussions were held in the various homesteads of village headmen in the five settlement regions. The discussions were administered by one moderator and two assistants who were taking down notes

and also observing non-verbal communications. The research assistants were selected from the local community and were able to speak and write in the local language (Isukha and Tiriki) and in English as well. Each focus group discussion lasted for an average of one to one hour and half. After each focus group session, the researcher and the moderators met to review and compile the data before conducting the next focus group. In this way, emerging topics in the previous discussions could be discussed and thus improving the overall quality of the discussions. Major topics addressed during focus group discussions and key informant in-depth interviews are summarized in [Table 2](#).

3.3.3. Participant observation

Participant observation can be described as a three stage process in which the researcher first gains access to a particular community, then lives and/or works among the people under study in order to better become acquainted with their ways of life, observes the communities and the environment, and finally analyses the information collected. Participant observation provides the opportunity to collect important qualitative data to capture human behaviour in its broad natural context at different times and from a multitude of perspectives (Glaser, 1996). It also enables the researcher and participants to develop a rapport and trust that it is necessary for participants to reveal the “backstage realities” of their experience that are generally concealed from outsiders or what they would not reveal during interviews. As Hammersley suggests, “to rely on what people say about what they believe and do, without also observing what they do, is to neglect the complex relationship between attitudes and behaviour” (Hammersley, 1990, p. 597). For this study, close relationship was established with the local community of Kakamega Forest to the extent that the investigator could freely interact and talk with community members. During bicycle rides and walks within the villages, observations were made on how the community use forest resources and the land adjacent to the Forest.

After in-depth group discussion sessions, some group members invited the investigator to visit their homes. During such visits, further observations were made on household use of forest resources as well as community life. While staying at the tourist Bandas (accommodation facility whose roof is made of grass and walls made of mud), the author also made close observations on spending and consumption patterns of tourists staying at the Bandas. The observations were recorded in a field notebook for further analysis.

3.3.4. Photo-elicitation interview

Many situations including daily interaction, where words fail, visual images ignite (Scarles, 2010). Photographs are therefore one of the most common form of visual images used in research context. In this methodology, photos rather than questions which may or may not make sense to the informant, become the focus of discussion (Loffler, 2004). In the

Table 2. Major topics addressed during key informant interviews and focus group discussions.

Benefits obtained by the Community from Kakamega Forest
Community involvement in forest conservation
Activities of community-based organizations
Land use and preference
Services provided by tour operators to and ecotourism facility operators in Kakamega Forest

interview setting, the photos elicit stimuli as the participants are immersed in a process of self-exploration and understanding. The participants work in collaboration with the researcher in a more equal and natural environment to portray, describe, or analyse a social phenomenon (Harper, 2002). The researcher does more listening as the participants interpret the photographs (Collier & Collier, 1986; Loffler, 2004). This method overcomes some communication and cultural barriers in cross-cultural studies (Liebenberg, 2009; Pink, 2007), and reduces language barrier in circumstances where the researcher and the participants have different first languages (Yuen, 2004). In this study, the researcher did not share the same culture as the participants. The researcher is of African origin and speaks native Luo and English as the first and second language respectively whereas the participants speak German as a first language. Thus, photo-elicitation interview was considered as an appropriate method for gathering information. The method was used to discuss livelihood, conservation and management aspects of the Berchtesgaden National Park region. Some of the information arising from photo-elicitation interviews formed a basis for in-depth interviewing. The researcher met the Head Ranger of Berchtesgaden National Park three weeks prior to the interview and briefed him on the study aim, objectives and themes for photo-elicitation interview. These themes were: Tourism, Resource use, Biodiversity conservation, socio-cultural and heritage activities in the Berchtesgaden National Park region. Park rangers working in Berchtesgaden National Park voluntarily participated in the photo elicitation interview. The rangers were familiar with the Berchtesgaden National Park region having lived and worked in the area for at least 5 years. In addition, they had working knowledge and experience in the chosen themes. Although the respondents were very fluent in German language, they were also able to speak basic English language. This further made this group of respondents a choice for the researcher since they translated their photo-elicitation interpretations to English. A total of four rangers participated in the interview with the head ranger conducting the interview while the other three being interviewees. Each participant was asked to take three photographs within the broad themes of tourism, resource use, biodiversity conservation, socio-cultural and heritage activities. Each participant brought the photos to the interview room and were allowed to freely offer their own interpretation. Some illustrations of the pictures taken are shown in [Figure 4\(i-iv\)](#).

The interview took place in the Head Rangers' office adjacent to Berchtesgaden National Park. The interviews lasted one hour. In order to enhance validity of the interviews, the researcher permitted participants to take photos and offer their own interpretation. The researcher also used an experienced and long serving (over five years) head ranger to moderate the interviews. Issues that were not clear were further probed by the researcher at the end of each photo-elicitation interview.

3.3.5. Key informant in-depth interviews

The quality of information gathered during in-depth interview largely depends on selecting the right informants. The study considered individuals and institutions that possess conservation and livelihood knowledge and experience, as well as long standing relationship with Berchtesgaden National Park. Additionally, the interviewer consulted with the Director of Berchtesgaden National Park who is experienced and knowledgeable about the Park in order to get a list of informants. Based on these criteria, the following institutions and key informants were selected for in-depth interview – refer to [Table 3](#).



Figure 4. (i) Tourism in winter at Klausbachthal valley. (ii)–Fallen tree within the Park left to decompose naturally. (iii)–Butterfly forms part of the rich Biodiversity in the Park. (iv)–Grazing of cattle in the Alpine meadow is an ancient cultural activity among farmers in the region.

Questions were asked based on the contextualized livelihood framework (Refer to [Table 1](#)) as well as results obtained from photo-elicitation interview: Natural assets (tourism and biodiversity); Livelihood strategies (tourist accommodation, production and sale of cheese, milk and traditional liquor); and Livelihood outcomes (increased openings in the Forest which allow easy movement of biodiversity). The questions were not uniform in number and meaning across all the informants but were within the broad framework for the study topic. As the interview proceeded, the informants were encouraged to reflect more deeply on the meaning of their comments. This allowed the interviewer to go beyond the answers that were given at the face value to attach meaning to the responses. At the end of each interview, areas that were not clear were clarified to the interviewer. The interviewer also read to the informant the major points discussed and enquired whether there was anything else the informant would wish to say that was not asked. A total of 18 key informants were interviewed. These interviews were largely conducted in English language except for a few exceptional cases that required translation from German to English language. Each interview lasted for between 30 and 45 min and was conducted at the informant's place of work.

3.4. Improving validity and reliability of the interviews

Since the selection of key informants was through non-probability sampling, the investigator had a second look at the list of key informants to ensure that it was representative based on experience, knowledge, and gender. The investigator hypothesized some of the

Table 3. Institutions and key informants selected for in-depth interview.

Institution	Key informants	Number of Key Informants interviewed
Berchtesgaden National Park (BNP)	Park Director, Museum curator, Head Ranger, Head Nature and Planning unit	4
Outdoor Recreation club	Outdoor club manager, Outdoor club tour guide	2
Hotels and Restaurants	Edelweiss Hotel – Group Reservation and Event Manager, Sanct Bertholomeu-Restaurant Manager, Alpen Küche – Restaurant Manager	3
Industry and Commerce	Representative for München und Oberbayern	1
University of Würzburg	Research experts in Tourism aspects of the BNP	2
Community staying adjacent to Berchtesgaden National Park	Mayor of Schönau am Königsee – representing Schönau am Königsee community, Mayor of Ramsäü – representing Ramsäü community and Mayor of Berchtesgaden – representing Berchtesgaden community	3
Tourism operators in Königsee	Drivers of tourist buses, Souvenir vendors and Boat operators	3

pre-conceived thoughts and notions, and thereafter looked for evidence to negate them during the interview. Since the key informants were experts in the area under study, the interviewer was cautious to avoid being partial to their comments and views. The summary of each interview was also read to each informant after the interview in order to clarify points that might have been misunderstood or ignored.

4. Data Analysis

The study used thematic data analysis. Braun and Clarke (2006) define thematic analysis as a method for identifying, analysing, and reporting patterns within data. There are six clearly defined steps in thematic analysis, namely familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

The researcher immersed himself in the data by reading and re-reading through every information collected on conservation, livelihoods, and protected area management in order to gain familiarity. With the help of a highlighter, the data were systematically coded taking note of emerging potential codes, patterns, and themes. An illustration is shown on Table 4 on how this was done for some aspects of Berchtesgaden National Park. Coming from Table 4 were several codes which were listed and sorted for potential themes for example ecological services, resource use, biodiversity conservation, alpine farming, and cattle grazing were all put under the theme of conservation and land use. Like these, several themes were searched within the codes and identified for all the data that was collected. In order to refine the themes further, a review was done on the identified themes with a view of making them comprehensible. As such, a theme like land use and conservation was further divided into alpine farming, conservation and benefits from nature whereas tourist accommodation and economic gain from tour guiding were collapsed into the tourism theme. The review continued for all the codes and themes until comprehensible themes emerged from the data. The last part of the analysis involved examining the themes and relating them with the relevant aspects of the data. This was necessary so as to remove any sub-themes that may still

have existed among the themes. Each theme was also examined for its individual narrative. As an example, a theme which was previously identified as tourism was changed to read benefits from tourism to reflect on the data and the narrative. It is only at this point that each theme was officially named. The names depicted what the themes were all about for example alpine farming, benefits from nature and benefits from tourism. This procedure was followed for all the data that was collected.

5. Results and discussions

5.1. Results

The results are presented in a tabular and comparative format following the livelihood dimensions chosen from the conceptual framework and presented in Table 5. Discussions and implications of the results are presented towards the end of this chapter.

Table 4. An illustration of coding of data for some livelihoods aspects.

Profile	Data Item	Initial code
1	Whenever there are festivals in which the Park administration is involved, the local people (e.g. farmers, craftsmen) are actively involved in the organization	Inclusion & control
2	The local community benefits from BNP through health sanatoriums in the city of Berchtesgaden; maintenance of trails (which they use); free entry to BNP for tourism and resource use	Health Access to Parks
3	Rental rooms for tourists within the five villages – the local people provide rooms within their homes for tourist accommodation Farmers – traditional kind of agriculture in the Alpine meadow. This is extensive and not intensive agriculture. The cultivation of the forest and grazing of the cattle opens up the closed areas and allows movement of animals (i.e. butterflies) from one place to another and thus enhances biodiversity in the alpine meadow	Tourist accommodation Alpine farming Biodiversity
4	Farmers – grazing of cattle in the alpine region during summer ensured that the cattle is away from the Valley to allow the grass to grow for the use in the winter. They do not own the land but have ancient rights to graze the cattle.	Cattle grazing
5	The farmers also have ancient rights to make traditional liquor from roots of certain plants The farmers also have rights to use wood from the Park to repair their fences and summer hats.	Access to natural resources
4	Drinking water for the residential areas such as Ramsau, Berchtesgaden Market, and Schönau come from Klausbach valley and Wimbach valley which are located in BNP. The forest in Schutzwald provide protection to residential areas such as Ramsau from Avalanche Traditional agriculture culture has existed over many years and this has influenced zonation of the Park to provide a subsistence zone for their	Ecological service
5	Farmers still keep the animals as in the ancient times. Celebrations of movement of cows from the alpine meadows to the lowlands. High quality of life for the people of the City of Berchtesgaden – they use the park for recreation activities such as mountaineering, skiing, hiking etc.	Ecological service
6	Farmers are allowed to do cultivation and grazing of animals. They graze the cattle during the summer on the alpine mountains and return them to the small farms in valleys during winter. This is usually a celebration characterized by cultural activities	Resource use
7	Skiing competition (Watzmann – Gams) – this is an old tradition that started before BNP was established and it is still practiced to date. Tour guiding is also done and the guides are paid for guiding the tourists. Both the skiing competition and tour guiding are ancient rights that started even before the establishment of the Park	Sports competition Economic benefits of tour guiding
8	The cultural ceremony of taking cattle in the alpine mountains has the advantage of bringing farmers who apart from looking after their animals, also take care of flowers and trees	Culture Biodiversity conservation

Table 5. Conservation and livelihoods experiences from Kakamega Forest and Berchtesgaden National Park.

Kakamega Forest	Berchtesgaden National Park (BNP)
<p>Social and Natural Assets available to the local community</p> <p>Membership of local community in various community based organizations such as Kakamega Environmental Education Programme, Bukhaywa Village Conservation Committee. Activities focus on environmental education and raising of tree seedlings. Ecological services-fresh air, source to several rivers, scenic qualities. Resources – trees, poles, firewood, thatch grass, biodiversity, wild honey, fruits, vegetables and medicinal plants.</p>	<p>Ski clubs organize sporting competitions (Watzmann – Gams) and Ice channel (Rodel weltcup). German Alpine Association and Berchtesgaden Mountaineering Association maintain trails and provide tour guide services respectively. Natural assets – wood for repairing summer hats and fences, Forest land for agriculture, Ecological services – drinking water from Klausbach and Wimbach valley, Forest protection from avalanche, Habitat to wildlife, Mountainous landscape, greenery and fresh air.</p>
<p>Legal and Policy frameworks that regulate livelihood, conservation and management</p> <p>Kenya Wildlife Service and Kenya Forest Service manage through a memorandum of understanding focusing on law enforcement, licensing of permitted extraction of forest produce, control of animals, maintenance of trails and forest roads, the raising of public awareness on conservation and tourism development. Legal framework of Wildlife Conservation and Management Act 2013; Forest Act 2005; and Environmental Management and coordination Act 1999 also govern the forest.</p>	<p>Berchtesgaden National Park is regulated by Federal law on nature protection, Bavarian law on nature Protection, National park ordinance, Convention frameworks, Mutually agreed principles and National park plan. Ecological networks hold a prominent position in the Federal Law on Nature protection. Since 2008, Bavaria adopted Biological Diversity strategy which partly addresses the aspects of ecological connectivity. At the state level, the Bavarian law on nature protection gives provisions on protection of nature and landscape as well as recreation. The national park ordinance gives directions related to the establishment of the national Park. Alpine convention framework consisting of six alpine countries (Austria, France, Germany, Italy, Liechtenstein and Switzerland) achieved through protocols. Berchtesgaden Principles of regional cooperation that regulate resource use, conservation and sustainable development in mountain regions.</p>
<p>Livelihood Strategies and Outcomes</p> <p>Land transactions – leasing, selling and buying, mixed farming, bee keeping, poultry keeping, tree nurseries and farming, business enterprises, tour guiding, employment in hospitality establishments, sale of flowers, manure, vegetables, meat and chicken to hospitality facilities. Outcomes – more income earned from tour guiding, sale of farm produce to tourists and hospitality establishments. Conservation of trees, butterflies, primates and circumcision ceremony sites.</p>	<p>Homestay by farmers and other park adjacent community members; Tourism – health tourism, mountaineering, skiing, sight-seeing and hiking; Alpine farming – cultivation, keeping of cattle, production and sale of milk, cheese and traditional liquor; Use of significant physical features in the Park for business advertisement; Use of Park logo by locals to advertise their events. Outcomes – As a result of tourism related activities in the Berchtesgaden region, income from tourism is estimated to be equivalent to creation of 470 jobs (Interview with Director BNP, 2015); Outcomes – strengthened cultural and heritage activities among the farming community; Enhanced biodiversity conservation – the cattle opens up closed areas and allows movement of animals such as butterflies which enables them to feed and reproduce; Farmers take care of flowers and trees as they graze their animals; Active participation of local community in Park management and decision making; Sustainable use of Forest – one side of the wooden tile is used and when it is worn out, the tile is turned over to use the opposite side; High quality recreational health in the Berchtesgaden region due to park access and sanatoriums together with ecological services</p>
<p>Nature of livelihood linkages between local community and protected area management</p> <p>The nature of linkages is characterized by dependence on forest resources (for example firewood, medicinal plants, bee-keeping) and economic opportunities and services provided by hospitality establishments and protected area management. This includes employment of the locals in and purchase of farm produce by hospitality establishments within the Forest, provision of tour</p>	<p>protected area management</p> <p>Social – cultural as a result of sporting activities and cultural ceremonies that accompany the return of farmers from the alpine mountains to the valleys. Ecological – the Park provides natural asset for tourism and ecological services such as fresh water, a congenial environment for recreation and recovery from health related conditions. Economic – tourism functions as an important economic</p>

guiding services by the locals. The Kenya Forest Service provide forest land for the establishment of community projects such as accommodation facilities.

drive for farmers, local people, business establishments in Berchtegaden city (Sports shops, Hospitality, Bus transport companies and Sanitariums).

5.2. Discussions

The social livelihood assets in Kakamega forest consist of local people's membership in community based organizations. The activities in these organizations are on a small scale, seasonal in nature and not directly linked to tourism in Kakamega Forest. As a result, the activities do not provide enough incentives necessary for active involvement in conservation. Although the establishment of the Kakamega Forest as a protected area has greatly improved ecosystem services, such as clean air and fresh water sources, it has nevertheless reduced the use of resources related to natural assets such as harvesting and use of medicinal plants, poles, and thatch grass, among others.

The administrative dualism of Kakamega Forest is one of the factors that is responsible for the unbalanced resource use between the local community in the southern and northern fringe of the Forest. Community members living in the southern part of the Forest have relatively better resource access than their counterparts in the northern part which is strictly managed as a nature reserve. The Forest management has a limited administrative legal framework as the management heavily relies on three Acts: Forest Act 2005, Wildlife Conservation and Management Act 2013 and Environmental Management and coordination Act 1999. These pieces of legislation are operated at the national level. The Forest lacks localized pieces of legislation that can be operated at the County level of governance.

Most of the livelihood strategies being used by the local community of Kakamega forest are operated in small scale and with minimal protected area management support. Furthermore, the strategies have a weaker link to tourism and conservation activities. The resulting outcomes are therefore economically and ecologically weak, lacking the necessary incentives for forest conservation.

The nature of linkages between the local community and Kakamega forest can be categorized into: inter-relationships that are based on forest resource use and activities (for instance collection of firewood, medicinal plants, bee-keeping and raising of tree-seedlings); and linkages developed as a result of economic opportunities and services provided by hospitality establishment, tour operators and protected area management. In the latter linkage, the locals are employed in hospitality establishments which also purchase farm produce such as chicken, vegetables, and milk from the local community. Tour operators do not have a strong link with the local community or the Kakamega Forest, as in most cases, they bring tour guides and make financial spending from outside Kakamega forest region. The protected area management has provided forest land where community owned accommodation facilities have been built. The Forest management also provide opportunities for locals to work as tour guides, and occasionally bring about non-monetary benefits to the community (construction of classrooms and provision of learning materials). Apart from the linkage between the locals and hospitality establishments, the rest of the linkages are weak and can neither guarantee sustainability of the livelihoods nor long-term conservation of Kakamega Forest.

From the foregoing, it is evident that the current state of livelihoods in the Kakamega forest region cannot assure sustainable conservation of the forest. There is need to reconcile the livelihood needs of the local people with the conservation objectives of Kakamega Forest. This was achieved through a model developed by identifying certain livelihoods and conservation experiences from Berchtesgaden National Park and integrating them with those of Kakamega Forest. The key results emanating from Berchtesgaden National Park (BNP) which were considered for adoption and integration in the Kakamega Forest region are summarized below:

- (i) Social & natural assets – the assets in the BNP are stronger and tend to have a close link to tourism which ultimately gives a strong economic output. Greenery and fresh air, an ecological service derived from natural assets is greatly utilized in sanatoriums for health tourism.
- (ii) Diversity and nature of governance framework – National and state-specific laws, mutual agreements, principles and convention frameworks are applied in the conservation and management of BNP
- (iii) Livelihood strategies in BNP are directly linked to tourism and regulated by state agencies thus guarantying reliable economic, ecological and cultural outcomes
- (iv) Co-partnering in decision making – Whenever there are decisions to be made regarding the BNP, the Park administration, Community members, and other stakeholders are considered as equals. This has empowered the local community and greatly improved their relations with the Park administration over the years.
- (v) The BNP administration allows local people to use Park logo to advertise their festivals and other entrepreneurial activities
- (vi) The nature of livelihood linkages between the local community and the BNP is tourism centred, strong and diversified ranging from socio-cultural, economic through to ecological. This has been enhanced by the fact that the Park together with the adjacent region of Berchtesgaden is a Biosphere Reserve.

Against this background, a livelihood – conservation model for Kakamega Forest region was developed – Refer to [Figure 5](#). This model has co-management and partnering in decision making forming a core and an important pillar for sustainable conservation of Kakamega Forest. This pillar is further dependent on four sub-pillars: Diversification and marketing of tourism products and experiences, Activities of Community Based Organisations (CBOs), Food security, and Governance structures for Kakamega Forest region. The four pillars are each dependent on several activities as indicated in [Figure 5](#). The activities in the four sub-pillars are people centred implying that all the activities taking place require the co-operation and decision making with the local community of Kakamega Forest.

In order to increase tourism in Kakamega Forest region, it is not only important to market tourism aggressively but also diversify the products and experiences. Revamping and publicizing cultural activities, such as circumcisions and bull fighting ceremonies (cultural tourism) together with introducing sanatoriums for wellness tourism would widen the spectrum of tourism experiences. As activities of most CBOs are not directly linked to tourism, the model provides a shift to activities such as sale of locally made souvenirs, home stays, and rearing and sale of butterflies. These activities are focused on

tourism and forest conservation and likely to contribute to overall sustainable conservation of Kakamega Forest. Agriculture and specifically crop cultivation is a key livelihood strategy in the Kakamega Forest region. However, the intensity and scale of crop cultivation makes the activity a threat to the conservation of the Forest. The model argues that people need to be food secure so as not to encroach into forest land for farming activities. This can be achieved through the use of green house and organic farming, as most land parcels are generally small due to the high human population around the Forest. The Government would further reduce forest encroachment by enforcing regulations that prevent further sub-divisions of small land parcels. Governance structures of Kakamega Forest, just like most protected areas in Kenya, are greatly limiting in terms of diversity and ecosystem specificity. The model has therefore come up with localized legislation at the county level. However, this requires amendments to the current legal and policy frameworks on counties to give them autonomy on legislation that is specific to conservation activities in their counties. The model also puts non-legal structures, which could take the form of memorandum of understandings and principles, as other governance structures for Kakamega Forest. The memorandum could be made with institutions such as Lake Victoria Water Management Board (depends on the Forest as a source to several rivers that drain in to the Lake), Tea factories operating in the surrounding of the Forest (benefit from tea leaves and ecosystem services from the Forest), adjacent forest ecosystems (North and South Nandi Forest – due to ecological connectivity),

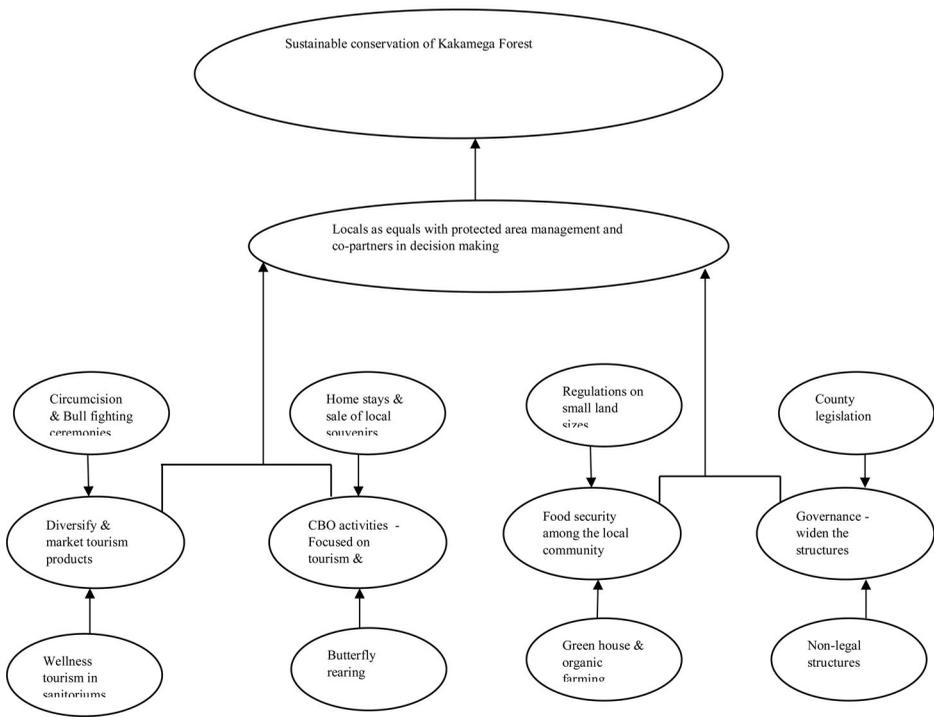


Figure 5. Livelihood-Conservation Model for Kakamega Forest region.

and Business organizations in major urban centres such as Kakamega and Kisumu that use resources from the Forest.

It is important to note that for this model to function effectively, the local community have to be considered as equals with protected area management and co-partners in all decisions that are made about the Forest. Government support in legislation through the line ministries of trade, tourism and environment is also vital. For instance, ministry of tourism need to embrace and market tourism aggressively. Ministry of trade needs to provide periodic training and extensions services on entrepreneurial skills to the community. The ministry of environment has to ensure that all activities (including tourism) conducted in the Forest do not adversely affect the ecosystem.

6. Conclusions and recommendations

6.1. Conclusions

The overarching objective of the study was to analyse conservation, livelihoods, and management experiences for both Kakamega Forest and Berchtesgaden National Park with a view of developing a livelihood-conservation model for the Kakamega Forest region in western Kenya. Based on the results, it can be deduced that:

- (i) Whereas the social assets in Kakamega Forest consist mainly of membership of local people in community based organizations, assets in Berchtesgaden National Park are sports oriented. Natural assets in both Kakamega Forest and Berchtesgaden National Park are resource based and also have ecological service functions.
- (ii) The legal and policy frameworks that regulate livelihoods, conservation, and management of Kakamega Forest are limited to Wildlife Conservation and Management Act 2013; Forest Act 2005; and Environmental Management and coordination Act 1999. Unlike Kakamega Forest, Berchtesgaden National Park has a variety of governance frameworks that range from National and State specific laws, mutual agreements, to principles and convention frameworks.
- (iii) Most livelihood strategies applied by the local community of Kakamega forest are operated in small scale and usually with minimal protected area management support. The strategies also have a weaker link to tourism activities. Most of the strategies applied in Berchtesgaden National Park are directly linked to tourism and regulated by state agencies thereby assuring reliable socio-economic, ecological and cultural outcomes.
- (iv) The local community relate with Kakamega Forest based on forest resources, economic opportunities, services provided by hospitality establishments and protected area management. Tour operators to Kakamega Forest region do not have a strong economic link with the region. The livelihood linkages in the Berchtesgaden National Park region are tourism centred, diversified, and socio-culturally, economically, and ecologically reliable.
- (v) Based on the model developed, it is possible that the local community of Kakamega Forest can adequately meet their livelihoods while actively participating in conservation. The model demonstrates that for this balance to be achieved, the local community have to be considered as equals with protected area management and co-partners

in all decisions that are made about the Forest. The model further shows that no single approach is adequate for achieving the often delicate balance between livelihoods and conservation. Rather, a multi-faceted and integrated approach to conservation of the Forest is adopted by the model. This is because the high resource off take from Kakamega Forest is attributed to not only local community use but also other external factors like policy failures in other sectors such as health, land and energy; high demand for forest products like charcoal and timber which is exerted by Kakamega town and other peripheral urban centres.

6.2. Recommendations

- a. Future conservation interventions in the Kakamega Forest region need to be people-centred, in which the local people have the right and power to make decisions about how they want the Forest to be managed.
- b. It is worth noting that just like any other protected area elsewhere, Berchtesgaden National Park has its own conservation and management challenges. The fact that it was chosen as a benchmark does not necessarily imply that it is perfect. Furthermore, the two protected areas are in different geo-political and ecological regions which makes it difficult to directly apply some of the livelihood, conservation and management experiences in Berchtesgaden National Park to Kakamega Forest. Thus, a cautionary approach ought to be taken while using the model.
- c. Although a livelihood-conservation model has been developed for Kakamega Forest region, a number of questions related to the competing uses of the Forest still remain. For instance, how much benefit would be considered by the local community as adequate in order to provide incentives for the conservation of Kakamega Forest? Are the benefits provided by Kakamega Forest Management perceived in the same way by the local community? To what extent should crop cultivation around the Forest and household use of forest resources be undertaken while still maintaining sustainable conservation of Kakamega Forest? The answers to these questions greatly depend on one's value judgement, most of which is subjective. Thus, the future of protected areas, especially in developing countries like Kenya, will depend to a greater extent on more understanding about the scale of resource use in the perspective of competing stakeholder interests and linkages between protected area management and the adjacent local communities. Further research in this direction would be commendable.

Disclosure statement

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