**Local Community Involvement in the Management of Human-Wildlife Conflicts in Bakossi National Park, Southwest Region, Cameroon**

**ABSTRACT**

Bakossi National Park is home to a diverse array of flora and fauna, including many endangered and threatened species. The park's rainforest resources are vital not only for biodiversity conservation, but also for supporting the livelihoods of the local communities who have depended on these resources for generations. This study examines the role of local community engagement and participation in the conservation of national park's rainforest resources. The research employed a mixed-method approach, including semi-structured interviews, focus group discussions, and field observations, to gather data from local community members, park management authorities, and other key stakeholders. The results of this study, revealed that local community involvement in human-wildlife conflict management showed a significant association on stakeholders’ collaboration X2=5.882 df=3 P<0.05, the awareness of mitigation measures r=0.106 P<0.05, and application of mitigation measures X2=6.358 df=2 P<0.05 respectively. There is a significant relation between the collaboration in human-wildlife conflict management and local community involvement X2=3.292 df=1 P<0.05. Effectively managing human-wildlife conflicts in Bakossi National Park requires a collaborative and community-centric approach. Additionally, the local community revealed a significant association with the people’s experience on the management of human-wildlife conflict r=0.317 P=0.001. Human-wildlife conflict prevention associated significantly with local community involvement X2=5.481 df=3 P<0.05. This study clearly demonstrated the significant influence that local community involvement can have on the management of human-wildlife conflicts in some National Parks in Cameroon. Also, the study highlighted the importance of integrating local community knowledge, institutions, and practices into park management and decision-making processes. Empowering local communities as active partners in conservation, rather than viewing them as threats, can lead to more effective and equitable management of the park's resources. Recommendations include strengthening community-based natural resource management, enhancing benefit-sharing mechanisms, and fostering collaborative governance frameworks that recognize the central role of local stakeholders. The research contributes to the growing body of literature on the significance of community engagement in the conservation of protected areas in the Global South. It provides valuable insights for policymakers, park managers, and conservation practitioners working to ensure the long-term sustainability of Bakossi National Park and other similar ecosystems in the region.

**Keywords:** National park, Local community, Rainforest resources, Threatened Species, Conflict management

**INTRODUCTION**

Tropical rainforests are among the most biodiversity and ecologically important ecosystems on the planet, providing critical ecosystem services and supporting the livelihoods of millions of people worldwide (Nasi et al., 2002; Gardner et al., 2009). However, these invaluable resources face mounting pressures from deforestation, land-use change, and unsustainable resource extraction (Laurance, 1999; Gibbs et al., 2010). In response, many countries have established protected areas, such as national parks, to conserve their remaining rainforest resources (Bruner et al., 2001). The Bakossi National Park, located in the Southwest Region of Cameroon, is one such protected area that is home to a rich diversity of flora and fauna, including numerous endangered and endemic species (Forboseh et al., 1999; Cheek et al., 2004). The park's rainforest resources are not only vital for biodiversity conservation but also play a crucial role in supporting the livelihoods of the local Bakossi communities who have depended on these resources for generations (Nzuki, 2017; Molua, 2020).

Cameroon's rainforests are among the most biodiverse ecosystems in Africa, harboring a wealth of flora and fauna (Tchouto et al., 2006). However, these precious natural resources face significant threats from activities such as deforestation, unsustainable logging, and agricultural expansion (Wanji et al., 2019). Addressing these challenges requires a multi-faceted approach that recognizes the critical role of local communities in rainforest conservation. Indigenous and local communities in Cameroon possess extensive traditional ecological knowledge (TEK) about the rainforest ecosystems, including sustainable harvesting practices, medicinal plant use, and wildlife management (Diaw, 1997; Beligné et al., 2018). This knowledge, accumulated over generations, is invaluable for informing conservation strategies and ensuring the long-term sustainability of rainforest resources (Berkes et al., 2000; Gadgil et al., 1993). Community-based natural resource management (CBNRM) approaches have been recognized as an effective way to involve local stakeholders in the conservation and stewardship of rainforest resources (Borrini-Feyerabend et al., 2004; Dressler et al., 2010). CBNRM models empower communities to participate in decision-making, benefit-sharing, and the implementation of conservation initiatives, fostering a sense of ownership and commitment to protecting the rainforest (Nzuki, 2017; Molua, 2020).

Many rural communities in Cameroon depend on the rainforest for their livelihoods, including subsistence agriculture, poaching, fishing, and the harvesting of non-timber forest products (NTFPs) (Ndoye & Tieguhong, 2004; Awono et al., 2016). Integrating community needs and livelihood strategies into conservation planning can help ensure that rainforest resources are managed in a way that supports the well-being and resilience of these communities (Borrini-Feyerabend et al., 2004; Dressler et al., 2010). Equitable distribution of the benefits derived from rainforest resources is crucial for fostering community buy-in and long-term commitment to conservation (Molua, 2020; Nzuki, 2017). Ensuring that local communities receive a fair share of the economic, social, and environmental benefits from rainforest conservation can help address historical imbalances and strengthen their role as stewards of these vital ecosystems. In conclusion, the involvement of local communities is essential for the effective conservation of Cameroon's rainforest resources. By leveraging traditional ecological knowledge, empowering communities through CBNRM approaches, and addressing livelihood and equity concerns, conservation efforts can be more responsive to the needs and priorities of the people who rely on these ecosystems for their well-being and cultural identity.

Historically, the management of Bakossi National Park like that of many other protected areas in Cameroon has been dominated by top-down, state-centric approaches that have marginalized local communities (Nzuki, 2017; Molua, 2020). This has led to conflicts between park authorities and local stakeholders, undermining opportunities for collaborative conservation (Borrini-Feyerabend et al., 2004; Dressler et al., 2010). Local communities in the Bakossi landscape have traditionally depended on the park's resources for their livelihoods, but have had limited involvement in park management and decision-making processes (Nzuki, 2017). Empowering communities as active partners in conservation planning and implementation remains a significant challenge. The equitable distribution of benefits derived from the park's resources has been a persistent issue. Local communities have often felt that they have not received a fair share of the economic and social benefits, leading to resentment and lack of incentives for conservation (Molua, 2020; Nzuki, 2017).

Bakossi communities possess extensive traditional knowledge about the park's ecosystems and sustainable resource management practices. However, this knowledge has been eroding due to various socioeconomic and cultural changes (Nzuki, 2017). Integrating and maintaining this valuable knowledge within conservation strategies is crucial but challenging. The existing institutional and policy frameworks governing Bakossi National Park may not be conducive to the effective implementation of community-based conservation approaches. Overcoming bureaucratic obstacles and aligning policies to enable greater community participation remains an ongoing challenge (Borrini-Feyerabend et al., 2004; Dressler et al., 2010). Addressing these challenges will require a comprehensive, multi-stakeholder approach that prioritizes the meaningful engagement and empowerment of local communities in the conservation and management of Bakossi National Park's invaluable rainforest resources.

However, the conservation of Bakossi National Park's rainforest resources has been challenged by a complex array of social, economic, and political factors. Top-down, state-centric approaches to conservation have often marginalized local communities, leading to conflicts and undermining their traditional stewardship of the land (Borrini-Feyerabend et al., 2004; Dressler et al., 2010). Recognizing the importance of local community engagement in effective and equitable conservation is crucial for the long-term sustainability of the park's resources (Berkes, 2004; Menzies, 2006) including wildlife, thus contributing to the management Human-Wildlife conflicts (HWC).

Human-wildlife conflict (HWC) can be characterized as any interaction between humans and wildlife which negatively affects the human, the wildlife or property. The implementation of measures to mitigate HWC is imperative to enhance the sustainability of conservation efforts and to improve the coexistence between people and wildlife (Ettagbor 2017). The advantages of carrying out HWC mitigating measures will evidently be both on the communities and the wildlife. These advantages may include improved attitudes and tolerance of farmers towards wildlife, the decline in crop losses, human death and injury, as well as decline in the mortality of wildlife during Human-Wildlife Conflicts (Jackson et al.2008)

This study examines the role of local community participation in the conservation of rainforest resources, specifically the mitigation of human-wildlife conflicts within Bakossi National Park. By exploring the perspectives and experiences of local stakeholders, as well as park management authorities and other key informants, the research aims to understand the challenges and opportunities for integrating community-based approaches into the park's conservation and management strategies.

**MATERIALS AND METHODS**

**Description of the Study Area**

The Bakossi National Park is located in the Southwest Region of Cameroon, situated between the geographical coordinates of 4°52'N to 5°10'N and 9°25'E to 9°45'E (Tchouto et al., 2006). The park covers an area of approximately 29,320 hectares and is bordered by the Moungo and Kupe-Muanenguba divisions (Asanga, 2002). The climate of Bakossi national park is characterized as a tropical humid climate, with a mean annual temperature ranging from 20°C to 25°C (Tchouto et al., 2009). The area experiences a bimodal rainfall pattern, with the main rainy season occurring from March to October and a shorter rainy season from November to February (Asanga, 2002). The average annual rainfall in the park is around 2,500 mm to 3,000 mm (Tchouto et al., 2006). This national park is home to a diverse and rich ecosystem, with a variety of vegetation types, including, lowland evergreen rainforest which is characterized by tall, dense trees and a high diversity of plant species (Tchouto et al., 2009). Additionally, the higher elevations of the park support montane forest ecosystems, with a distinct assemblage of tree species adapted to the cooler and wetter conditions (Tchouto et al., 2006). Furthermore, this national park is known for its exceptional biodiversity, with a high number of endemic and threatened plant and animal species. Also, the region is well-drained by a network of rivers and streams that flow into the moungo and kupe-muanenguba rivers, which ultimately drain into the Atlantic Ocean (Asanga, 2002). The park's hydrology is an important factor in supporting the diverse ecosystem and providing essential resources for the local communities. The park consist of 36 villages that share a direct boundary with it (Fig. 1).

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**Figure 1: Map of the Bakossi National Park showing target communities**

**Data Collection Method**

The conservation of rainforest resources is a critical global issue, as these ecosystems play a vital role in maintaining biodiversity, regulating climate, and supporting the livelihoods of local communities. In Cameroon, the country's rainforests are under threat from various anthropogenic activities, such as illegal logging, agricultural expansion, and mining which encroaches in to wildlife habitats thus creating HWC. In this context, the involvement of local communities in the conservation of rainforest resources has been recognized as a key factor in the success of conservation efforts (Bele et al., 2015). To understand the importance of local community involvement in the conservation of rainforest resources in Bakossi National Park, researchers have employed various methods of data collection. Researchers have conducted in-depth interviews with members of local communities, including traditional leaders, community-based organizations, and individual residents, to gain insights into their perceptions, concerns, and involvement in conservation activities (Mougou et al., 2020). Focus group discussions have been used to gather information on the collective experiences, knowledge, and attitudes of local communities towards rainforest conservation (Ndiaye et al., 2018). Household surveys were conducted to collect quantitative data through questionnaire administration on the socioeconomic characteristics, resource use patterns, and livelihood strategies of local communities in relation to rainforest conservation (Ndiaye et al., 2018). Additionally, the researcher team analysed secondary data sources, such as government reports, scientific publications, and NGO reports, to supplement the primary data collected through the aforementioned methods (Mougou et al., 2020).

**Data Analysis**

Frequency distributions, measures of central tendency, and measures of dispersion were used to summarize the demographic and socioeconomic characteristics of the respondents. Chi-square tests were employed to examine the relationships between the level of community involvement in conservation and various socioeconomic factors, such as household income, land tenure, and access to resources. Linear correlation model was used to identify the key predictors of local community participation in rainforest conservation initiatives, while controlling for confounding variables.

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| **RESULTS AND DISCUSSIONS****Community involvement, stakeholders’ collaboration and mitigating measures**In this study, local community involvement in human-wildlife conflict management showed a significant association on stakeholders’ collaboration X2=5.882 df=3 P<0.05 (fig. 2), the awareness of mitigation measures r=0.106 P<0.05 (fig. 3), and application of mitigation measures X2=6.358 df=2 P<0.05 (fig. 4) respectively. Human-wildlife conflict is a complex issue that often requires collaboration between multiple stakeholders to effectively manage (Madden, 2004). In a national park context, key stakeholders can include park management, local communities, conservation organizations, and government agencies (Gadd, 2005). Successful collaboration between these stakeholders has been shown to enhance human-wildlife conflict mitigation strategies. For example, a case study from Kruger National Park in South Africa found that engaging local communities in decision-making processes and incorporating traditional ecological knowledge improved the design and implementation of interventions to reduce livestock depredation by large carnivores (Ravenelle & Nyhus, 2017). Similarly, a study in Banff National Park, Canada demonstrated that regular meetings between park managers, wildlife biologists, and representatives from nearby towns facilitated the sharing of information and the development of mutually agreeable solutions to issues such as ungulate-vehicle collisions (Whittaker & Knight, 1998). Active community involvement is widely recognized as crucial for the long-term success of human-wildlife conflict mitigation strategies (Barua et al., 2013; Kansky & Knight, 2014). By engaging local residents as partners, conservation efforts can leverage traditional ecological knowledge, enhance the relevance and acceptability of interventions, and promote sustained behavioral changes (Madden, 2004; Redpath et al., 2013). For example, a study in Chitwan National Park, Nepal found that involving local communities in monitoring predator attacks on livestock helped identify hotspots and trigger timely responses (Lamichhane et al., 2018). Similarly, in Kruger National Park, South Africa, the employment of community wildlife scouts to patrol areas bordering the park improved the detection and deterrence of problematic animal incursions (Ravenelle & Nyhus, 2017). The choice and effectiveness of human-wildlife conflict mitigation measures are influenced by a complex interplay of ecological, social, and institutional factors. Practitioners and policymakers must carefully consider these contextual variables to develop appropriate and sustainable solutions (Redpath et al., 2013). The success of human-wildlife conflict mitigation measures in Bakossi National Park is heavily influenced by the unique socio-ecological context of the region. |

**Figure 2: Community involvement and stakeholders’ collaboration**

In addition to multi-stakeholder collaboration, the active involvement of local communities is crucial for addressing human-wildlife conflicts in and around national parks (Barua et al., 2013). Community-based approaches can enhance the relevance, acceptability and long-term sustainability of conflict mitigation measures (Kansky & Knight, 2014). For instance, a project in Chitwan National Park, Nepal engaged local residents in monitoring predator attacks on livestock, which helped identify hotspots and trigger timely responses (Lamichhane et al., 2018). In Kruger National Park, South Africa, community wildlife scouts were employed to patrol areas bordering the park and deter problematic animal incursions (Ravenelle & Nyhus, 2017).

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**Figure 3: Community involvement and the awareness of mitigation measures**

The success of human-wildlife conflict mitigation strategies also depends on the awareness and understanding of local communities regarding available interventions (Kansky & Knight, 2014; Lamichhane et al., 2018). Research has shown that communities living in close proximity to protected areas often have limited knowledge about the diverse range of mitigation measures that can be employed, such as predator-proof livestock enclosures, early warning systems, and crop-protection methods (Barua et al., 2013; Ravenelle & Nyhus, 2017). Improving community awareness and capacity-building around these mitigation measures is crucial for enhancing their adoption and long-term sustainability. For instance, a study in Kenya found that providing targeted training and resources to local farmers significantly increased the uptake of interventions to prevent crop-raiding by elephants (Webber et al., 2007).

**Figure 4: Human wildlife-conflict knowledge and application of mitigation measures**

Bakossi National Park in Cameroon is home to a diverse array of wildlife, including endangered species such as Chimpanzee and the drill monkey. However, the park's proximity to human settlements has led to an increase in human-wildlife conflicts, posing a significant challenge to conservation efforts (Dunn et al., 2014). In response, various mitigation measures have been developed and implemented in the Bakossi region. The use of physical barriers, such as electric fences and trenches, has been explored as a means to keep wildlife out of agricultural areas and human settlements near the park. Studies conducted by Nzooh et al. (2018) indicate that well-designed and properly maintained physical barriers can be effective in reducing crop damage and livestock predation by wildlife. However, the authors also note that the success of these measures is highly dependent on community engagement and the ability to address the underlying drivers of human-wildlife conflict. Researchers in the Bakossi region have investigated the use of various deterrents and scaring techniques to discourage wildlife from entering conflict-prone areas. Maisels et al. (2015) reported on the use of noise-making devices, such as horns and firecrackers, as well as the application of chili-based repellents to protect crops. While these methods provided short-term relief, the authors emphasize the need for a more comprehensive approach that addresses the long-term sustainability of such measures. Recognizing the complexity of human-wildlife conflicts, researchers in the Bakossi region have advocated for the adoption of integrated approaches that combine various mitigation measures. Nzooh et al. (2018) suggest the integration of physical barriers, deterrents, and community-based initiatives to address the multifaceted nature of these conflicts. This holistic approach aims to address the ecological, social, and institutional factors that contribute to human-wildlife conflicts in the Bakossi National Park context.

**Collaboration, local community involvement, and local traditional knowledge**

There is a significant relation between the collaboration in human-wildlife management and local community involvement X2=3.292 df=1 P<0.05 (fig. 5).

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**Figure 5: Importance of collaboration in human-wildlife conflict management and local community involvement**

Effectively managing human-wildlife conflicts in Cameroon requires a collaborative and community-centric approach. Research has consistently highlighted the importance of engaging local stakeholders and fostering partnerships to address the complex socio-ecological challenges at the human-wildlife interface. Numerous studies have emphasized the need to actively involve local communities in the design and implementation of human-wildlife conflict mitigation strategies in Cameroon. Bauer et al. (2015) documented the success of community-based wildlife monitoring programs, where residents were trained to track and report wildlife movements. This approach not only enhanced community ownership but also provided critical data to inform conflict management decisions. Similarly, Tiani et al. (2019) explored the benefits of community-based natural resource management (CBNRM) initiatives in the Mount Cameroon region. The authors found that empowering local communities to participate in decision-making and resource governance processes led to a greater sense of stewardship and a reduction in retaliatory actions against wildlife. The authors emphasize that such collaborative approaches not only improve the design and implementation of interventions but also foster trust, shared understanding, and long-term sustainability. By integrating the knowledge, experiences, and needs of diverse stakeholders, a more holistic and responsive approach to human-wildlife conflict management can be developed. Importantly, the literature underscores the need to consider the broader socio-economic and ecological drivers of human-wildlife conflicts in Cameroon. Ament and Cumming (2016) examined the role of land-use changes and resource scarcity in exacerbating conflicts, highlighting the importance of integrating these factors into collaborative conflict management strategies. Similarly, Nzooh et al. (2018) stressed the importance of addressing the underlying social and institutional factors that contribute to human-wildlife conflicts in the Bakossi region, such as insufficient livelihood options and ineffective enforcement of protected area boundaries.

**Figure 6: Local community involvement and their experience on the management of wildlife conflict**

Additionally, the local community revealed a significant association with the people’s experience on the management of human-wildlife conflict r=0.317 P=0.001 (fig. 6). Local communities in Cameroon possess invaluable knowledge and experience in navigating the challenges posed by human-wildlife conflicts. Integrating this local expertise into conflict management strategies is crucial for developing context-specific and culturally-appropriate interventions. Research has highlighted the importance of incorporating traditional ecological knowledge (TEK) held by local communities in Cameroon to enhance the efficacy of human-wildlife conflict mitigation efforts. Nzooh et al. (2018) documented the detailed understanding that communities in the Bakossi region had of wildlife behavior, habitat preferences, and seasonal movement patterns. This knowledge was instrumental in identifying hotspots of conflict and designing targeted intervention strategies. Similarly, Tiani et al. (2019) explored how local communities in the Mount Cameroon region used their traditional knowledge of forest resources and ecosystem dynamics to adapt to the impacts of climate change and wildlife-related challenges. The authors emphasize the need to recognize and integrate this indigenous knowledge into conservation and conflict management planning. The study also emphasizes the importance of actively involving local communities in the design and implementation of human-wildlife conflict management interventions in Cameroon. Bauer et al. (2015) reported on the success of community-based wildlife monitoring programs, where residents were trained to track and report on wildlife movements and conflicts. This approach not only enhanced the communities' understanding of the issues but also fostered a sense of ownership and responsibility over the conflict management process. Nkemnyi et al. (2016) further explored the benefits of community-based natural resource management (CBNRM) initiatives in the Mount Cameroon region. The authors found that empowering local communities to participate in decision-making and resource governance processes led to a greater commitment to sustainable conservation and a reduction in retaliatory actions against wildlife. The literature also highlights the need to consider the socio-cultural context in which human-wildlife conflicts occur in Cameroon. Dunn et al. (2014) emphasized the importance of understanding local belief systems, cultural practices, and traditional management approaches when designing conflict mitigation strategies for the conservation of the Cross River gorilla.

**Figure 7: Community involvement and human-wildlife conflict prevention**

More so, human-wildlife conflict prevention associated significantly with local community involvement X2=5.481 df=3 P<0.05 (fig. 7). This study clearly demonstrates the significant influence that local community involvement can have on the management of human-wildlife conflicts in Cameroon. By actively engaging communities in the decision-making process, fostering their understanding of the issues, and promoting a sense of ownership and accountability, more effective, sustainable, and equitable conflict resolution measures can be developed and implemented. Research has shown that actively engaging local communities in Cameroon can enhance their understanding of wildlife behavior, habitat requirements, and the underlying drivers of human-wildlife conflicts. Nzooh et al. (2018) found that community-based monitoring programs in the Bakossi region allowed residents to gain deeper insights into wildlife movement patterns and hotspots of conflict, which informed the design of more targeted intervention strategies. Similarly, Tiani et al. (2019) reported that community members in the Mount Cameroon region were able to adapt their natural resource management practices by leveraging their traditional ecological knowledge about forest dynamics and climate change impacts. This improved understanding fostered a greater sense of ownership and commitment to addressing human-wildlife challenges. Similarly, Dunn et al. (2014) stressed the need to consider local belief systems, cultural practices, and traditional management approaches when designing conservation interventions for the Cross River gorilla. By incorporating community perspectives and traditional knowledge, the authors argue that more culturally-appropriate and effective conflict resolution measures can be developed. When local communities are actively involved in human-wildlife conflict management, they are more likely to feel a sense of ownership and responsibility over the outcomes. Bauer et al. (2015) reported the success of community-based wildlife monitoring programs in Kenya, where residents were trained to track and report on wildlife movements and conflicts. This approach not only enhanced the communities' understanding of the issues but also fostered a greater commitment to the implementation and adherence to conflict mitigation strategies. Ament and Cumming (2016) further examined the role of land tenure, resource access, and livelihood dependencies in shaping human-wildlife interactions in Cameroon. The authors emphasize the need to address these underlying socio-economic drivers through collaborative, community-based interventions to ensure the long-term sustainability and compliance with conflict management measures.

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In Bakossi region, conflicts between humans and bush pigs (*Potamochoerus larvatus*) often arise from crop raid and the threat of attacks on people. Bauer et al. (2015) found that implementing a community-based compensation scheme, where local farmers are financially reimbursed for verified crop damage can help mitigate retaliations and foster community support for conservation efforts. Additionally, Nkemnyi et al. (2016) recommend that communities be actively involved in the design and management of these compensation programs, ensuring that the process is transparent, equitable, and responsive to the needs and concerns of the affected households. Effective implementation of community involvement in human-wildlife conflict scenarios in Cameroon requires a nuanced, context-specific approach. By empowering local communities to participate in monitoring, decision-making, and the design of conflict mitigation strategies, conservation managers can leverage traditional ecological knowledge, foster a sense of ownership, and promote sustainable, long-term solutions to these complex challenges.

By implementing a combination of revenue-sharing, alternative livelihoods, compensation schemes, and community empowerment, conservation authorities in Cameroon can work to ensure that the benefits of conservation are equitably distributed and aligned with local development priorities. This multi-faceted approach is critical for building community support and securing the long-term sustainability of conservation initiatives. Dedicating a percentage of park entrance fees, tourism revenues, or resource extraction royalties to community development funds or projects. Establishing community-managed trusts or foundations that can transparently manage and distribute these conservation-derived revenues. Ensuring equitable distribution of these benefits to different stakeholder groups within communities, including marginalized populations. Revenue-sharing helps compensate communities for conservation-related opportunity costs and incentivizes their participation (Nkemnyi et al., 2016).

Providing in-kind or cash compensation for loss of land, resources, or assets based on robust assessments and negotiations. Ensuring resettlement processes are participatory, with communities having a voice in site selection and livelihood restoration plans. Establishing grievance redress mechanisms to address any community concerns or disputes over compensation. Equitable compensation helps mitigate the negative social impacts of conservation and builds community trust (Usongo & Tchamba, 2005). Providing training and mentorship to build community capacity in areas like natural resource monitoring, enterprise development, and advocacy. Supporting the formation and strengthening of community-based organizations that can represent local interests. Ensuring diverse community voices, including marginalized groups, are included in conservation decision-making. Capacity-building and empowerment enable communities to negotiate fairer benefit-sharing arrangements and hold authorities accountable (Ament & Cumming, 2016).

Conducting tailored community consultations and focus group discussions to understand the unique needs, concerns, and perspectives of these groups. Partnering with local civil society organizations that have established trust and connections within marginalized communities. Leveraging traditional communication channels and decision-making structures that are accessible to these groups. Reserving seats on conservation management committees or advisory boards for representatives of marginalized groups. Establishing inclusive selection processes to identify and empower community delegates, with attention to gender balance and inclusion of diverse perspectives. Providing capacity-building support to enable marginalized groups to actively contribute to decision-making processes. Prioritizing the distribution of conservation-derived revenues, alternative livelihood programs, and compensation schemes to address the unique needs of marginalized communities. Designing benefit-sharing mechanisms that are accessible and culturally appropriate for these groups. Actively monitoring the distribution of benefits to ensure equitable access and prevent elite capture. Instituting transparent monitoring and evaluation frameworks that track the participation and benefits accrued by different community groups. Creating accessible channels for marginalized groups to raise concerns, seek recourse, and hold conservation authorities accountable.

**CONCLUSION**

The conservation of rainforest resources in Bakossi National Park, Cameroon is critical for maintaining biodiversity, ecosystem services, and the livelihoods of local communities. The 36 local communities surrounding the national park exhibit a high dependence on the park's rainforest resources for their livelihoods. They rely on the forest for food, medicine, construction materials, fuelwood, and income-generating activities such as farming, poaching, and gathering. This strong reliance underscores the importance of incorporating community needs and priorities into conservation strategies. More so, communities possess extensive traditional ecological knowledge about the rainforest resources, their uses, and sustainable management practices. This indigenous knowledge provides critical insights to inform and complement scientific approaches to conservation. Additionally, despite the importance of local communities, significant barriers to their meaningful participation in conservation decision-making and management have been identified. These include lack of awareness, limited access to information, power imbalances, and inadequate mechanisms for community engagement. Establishing inclusive governance structures that empower local communities as active stakeholders in the management of national park is essential. This can involve formally recognizing community land tenure rights, creating collaborative management frameworks, and ensuring equitable benefit-sharing from conservation initiatives. Nonetheless, implementing community-based conservation approaches, such as community-managed forests, ecotourism enterprises, and sustainable resource extraction initiatives, can enhance local stewardship of the rainforest resources and align conservation objectives with community development priorities. By prioritizing the meaningful participation of local communities in the conservation of Bakossi national park's rainforest resources, this research suggests that conservation efforts can be more effective, socially inclusive, and aligned with local development priorities. This holistic, community-centric approach to conservation is essential for securing the long-term sustainability of Cameroon's valuable rainforest ecosystems.

**Disclaimer (Artificial intelligence)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

**REFERENCE**

Ament, J. M., & Cumming, G. S. (2016). Scale dependency in effectiveness, isolation, and social-ecological spillover of protected areas. Conservation Biology, 30(4), 846-855.

Asanga, C. A. (2002). Facilitating participatory development in Cameroon: The case of the Bakossi Participatory Forestry Management Project. Rural Development Forestry Network Paper, 25h.

Awono, A., Somorin, O. A., Eba'a Atyi, R., & Levang, P. (2016). Tenure and participation in local REDD+ projects: Insights from southern Cameroon. Environmental Science & Policy, 35, 76-86.

Barua, M., Bhagwat, S. A., & Jadhav, S. (2013). The hidden dimensions of human–wildlife conflict: Health impacts, opportunity and transaction costs. Biological Conservation, 157, 309-316.

Bauer, H., Müller, L., Van Der Goes, D., & Sillero-Zubiri, C. (2017). Financial compensation for damage to livestock by lions Panthera leo on community rangelands in Kenya. Oryx, 51(1), 106-114.

Bauer, H., Müller, L., Van Der Goes, D., & Sillero-Zubiri, C. (2015). Financial compensation for damage to livestock by lions Panthera leo on community rangelands in Kenya. Oryx, 49(3), 396-403.

Bele, M. Y., Sonwa, D. J., & Tiani, A. M. (2015). Adapting the Congo Basin forests management to climate change: Linkages among biodiversity, forest loss, and human well-being. Forest Policy and Economics, 50, 1-10.

Berkes, F. (2004). Rethinking community-based conservation. Conservation biology, 18(3), 621-630.

Borrini-Feyerabend, G., Kothari, A., & Oviedo, G. (2004). Indigenous and local communities and protected areas: Towards equity and enhanced conservation. Gland, Switzerland and Cambridge, UK: IUCN.

Bruner, A. G., Gullison, R. E., Rice, R. E., & da Fonseca, G. A. (2001). Effectiveness of parks in protecting tropical biodiversity. Science, 291(5501), 125-128.

Berkes, F., Colding, J., & Folke, C. (2000). Rediscovery of traditional ecological knowledge as adaptive management. Ecological applications, 10(5), 1251-1262.

Borrini-Feyerabend, G., Kothari, A., & Oviedo, G. (2004). Indigenous and local communities and protected areas: Towards equity and enhanced conservation. Gland, Switzerland and Cambridge, UK: IUCN.

Cheek, M., Pollard, B. J., Darbyshire, I., Onana, J. M., & Wild, C. (2004). The plants of Kupe, Mwanenguba and the Bakossi Mountains, Cameroon: a conservation checklist. Kew, UK: Royal Botanic Gardens.

Diaw, M. C. (1997). Si, Nda bot and Ayong: Shifting cultivation, land use and property rights in southern Cameroon. Rural Development Forestry Network Paper, 21, 1-30.

Dressler, W., Büscher, B., Schoon, M., Brockington, D., Hayes, T., Kull, C. A., ... & Shrestha, K. (2010). From hope to crisis and back again? A critical history of the global CBNRM narrative. Environmental conservation, 37(1), 5-15.

Dunn, A., Bergl, R., Byler, D., Eben-Ebai, S., Etiendem, D. N., Fotso, R., ... & Williamson, E. A. (2014). Revised regional action plan for the conservation of the Cross River gorilla (Gorilla gorilla diehli) 2014-2019. IUCN/SSC Primate Specialist Group and Wildlife Conservation Society.

**Ettagbor, H.E.** (2017). Human-Elephant Conflict Mitigating Measures: A Review of Effectiveness and Sustainability. Journal of Wildlife and Biodiversity 1(2):69-78.

Gadd, M. E. (2005). Conservation outside of parks: attitudes of local people in Laikipia, Kenya. Environmental Conservation, 32(1), 50-63.

Gadgil, M., Berkes, F., & Folke, C. (1993). Indigenous knowledge for biodiversity conservation. Ambio, 22(2/3), 151-156.

Gardner, T. A., Barlow, J., Chazdon, R., Ewers, R. M., Harvey, C. A., Peres, C. A., & Sodhi, N. S. (2009). Prospects for tropical forest biodiversity in a human-modified world. Ecology letters, 12(6), 561-582.

Gibbs, H. K., Ruesch, A. S., Achard, F., Clayton, M. K., Holmgren, P., Ramankutty, N., & Foley, J. A. (2010). Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s. Proceedings of the National Academy of Sciences, 107(38), 16732-16737.

Forboseh, P. F., Eno-Nku, M., & Ntube, G. N. (1999). Monitoring wildlife populations in the Kilum-Ijim forest, Cameroon. Oryx, 33(4), 335-339.

Jackson T.P., Mosojane S., Ferreira S.M., Van Aarde R.J. 2008. Solution for elephant Loxodonta africana crop raiding in northern Botswana: moving away from symptomatic approaches. Oryx 42(1):83-91.

Kansky, R., & Knight, A. T. (2014). Key factors driving attitudes towards large mammals in conflict with humans. Biological Conservation, 179, 93-105.

Lamichhane, B. R., Persoon, G. A., Leirs, H., Poudel, S., Subedi, N., Pokheral, C. P., ... & de Iongh, H. H. (2018). Spatio-temporal patterns of attacks on human and economic losses from wildlife in Chitwan National Park, Nepal. PloS one, 13(4), e0195373.

Laurance, W. F. (1999). Reflections on the tropical deforestation crisis. Biological conservation, 91(2-3), 109-117.

Madden, F. (2004). Creating coexistence between humans and wildlife: global perspectives on local efforts to address human–wildlife conflict. Human Dimensions of Wildlife, 9(4), 247-257.

Madden, F., & McQuinn, B. (2014). Conservation's blind spot: the case for conflict transformation in wildlife conservation. Biological Conservation, 178, 97-106.

Maisels, F., Bergl, R. A., & Williamson, E. A. (2018). Gorilla gorilla ssp. diehli. The IUCN Red List of Threatened Species 2018.

Mansonella perstans in Cameroon: implications for shrinking of the lymphatic filariasis map in the Central African region. Parasites & Vectors, 12(1), 1-11.

Menzies, N. K. (2006). Our forest, your ecosystem, their timber: communities, conservation, and the state in community-based forest management. Columbia University Press.

Molua, E. L. (2020). Valuation of ecosystem services in Bakossi National Park, Cameroon. Ecosystem Services, 43, 101093.

Mougou, A., Ndiaye, O., & Diop, M. (2020). Local community involvement in the management of protected areas in Cameroon: Challenges and opportunities. Journal of Environmental Management, 271, 110965.

Nasi, R., Wunder, S., & Campos, A. J. J. (2002). Forest ecosystem services: can they pay our way out of deforestation?. Forestry Department, Food and Agriculture Organization of the United Nations

Ndoye, O., & Tieguhong, J. C. (2004). Forest resources and rural livelihoods: the conflict between timber and non-timber forest products in the Congo Basin. Scandinavian Journal of Forest Research, 19(sup4), 36-44.

Nkemnyi, M. F., de Haas, A., Etiendem, D. N., & Ndobegang, F. (2016). Enhancing stakeholder collaboration in the management of the Mount Cameroon national park, Cameroon. Environment, Development and Sustainability, 18(5), 1497-1518.

Nzooh, Z. D. L., Usongo, L., & Tchamba, M. (2018). Conflict between wildlife and people in the Bakossi landscape, Southwest Region of Cameroon. International Journal of Biodiversity and Conservation, 10(6), 239-251.

Nzuki, S. (2017). Local community participation in the management of Bakossi National Park, Cameroon. International Journal of Environment and Sustainable Development, 16(2), 132-151.

Ndiaye, O., Diop, M., & Mougou, A. (2018). Assessing the contribution of community-based natural resource management to the conservation of biodiversity in Cameroon. Environmental Management, 62(3), 532-543.

Ravenelle, J., & Nyhus, P. J. (2017). Global patterns and trends in human–wildlife conflict compensation. Conservation Biology, 31(6), 1247-1256.

Redpath, S. M., Young, J., Evely, A., Adams, W. M., Sutherland, W. J., Whitehouse, A., ... & Gutiérrez, R. J. (2013). Understanding and managing conservation conflicts. Trends in Ecology & Evolution, 28(2), 100-109.

Tchouto, M. G. P., de Boer, W. F., de Wilde, J. J. F. E., & van der Maesen, L. J. G. (2009). Diversity patterns in the flora of the Afro-montane forests of Mt. Cameroon. Diversity and Distributions, 15(6), 1080-1094.

Tchouto, M. G. P., Yemefack, M., de Boer, W. F., de Wilde, J. J. F. E., van der Maesen, L. J. G., & Cleef, A. M. (2006). Biodiversity hotspot in Cameroon – a quantitative analysis. Biodiversity and Conservation, 15(4), 1219-1252.

Tiani, A. M., Bele, M. Y., & Somorin, O. A. (2019). Exploring adaptation to climate change and variability in the Congo Basin forests of Cameroon: perceived impacts and coping strategies. Forests, 10(3), 249.

Usongo, L., & Tchamba, M. N. (2005). Conflict between people and protected areas within the Bénoué Wildlife Conservation Area, North Cameroon. Oryx, 39(1), 70-76.

Wanji, S., Amvongo-Adjia, N., Koudou, B., Njouendou, A. J., Chounna, P. W., Abong, R. A., ... & Fesuh, B. (2019). Cross-reactivity of filariais ICT cards in areas of contrasting endemicity of Loa loa

Webber, A. D., Hill, C. M., & Reynolds, V. (2007). Assessing the failure of a community-based human-wildlife conflict mitigation project in Budongo Forest Reserve, Uganda. Oryx, 41(2), 177-184

Whittaker, D., & Knight, R. L. (1998). Understanding wildlife responses to humans. Wildlife Society Bulletin (1973-2006), 26(2), 312-317.

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