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Environmental Conservation and Social Inequality in Buffer Areas: A Comparative Case Study Analysis

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Abstrack

This study explores how social disparities manifest in environmental conservation efforts within buffer zones of protected areas, adopting a comparative case study approach across ten diverse settings in Asia, Sub-Saharan Africa, Latin America. Drawing on qualitative data, it investigates the distribution of benefits, community engagement, and accessibility to natural resources. The analysis reveals that conservation models driven by incentives frequently deepen pre-existing inequities, particularly when policies are crafted without inclusive consultation or sensitivity to local realities. Common challenges identified include elite capture, resource privatization, limited representation of vulnerable groups, and displacements that disregard customary rights. Despite the presence of community-driven initiatives such as local monitoring schemes and ecotourism ventures their impact is often constrained by inadequate governance structures and superficial community involvement. The research underscores the necessity of embedding principles of justice and equity into conservation frameworks to achieve outcomes that are not only ecologically sound but also socially just. Conceptually, this work contributes to critical debates at the intersection of environmental governance and social equity. Practically, it offers guidance for policymakers to design more context-responsive, participatory, and rights-based conservation strategies. In sum, the findings affirm that sustainable conservation is unattainable without meaningful inclusion and respect for historical and cultural claims.

Keywords: Environmental Conservation, Social Inequality, Buffer Zone, Comparative Case Study, Equity and Participation

Abstrak

Studi ini mengeksplorasi bagaimana ketimpangan sosial tercermin dalam upaya konservasi lingkungan di zona penyangga kawasan lindung, dengan menggunakan pendekatan studi kasus komparatif di sepuluh lokasi yang beragam di Asia, Afrika Sub-Sahara, dan Amerika Latin. Berbasis pada data kualitatif, studi ini menyelidiki distribusi manfaat, partisipasi komunitas, dan aksesibilitas terhadap sumber daya alam. Analisis menunjukkan bahwa model konservasi yang didorong oleh insentif seringkali memperdalam ketimpangan yang sudah ada, terutama ketika kebijakan dirancang tanpa konsultasi inklusif atau sensitivitas terhadap realitas lokal. Tantangan umum yang diidentifikasi meliputi dominasi elit, privatisasi sumber daya, keterwakilan kelompok rentan yang terbatas, dan pengusiran yang mengabaikan hak adat. Meskipun terdapat inisiatif berbasis komunitas seperti skema pemantauan lokal dan usaha ekowisata, dampaknya seringkali dibatasi oleh struktur tata kelola yang tidak memadai dan keterlibatan komunitas yang superficial. Penelitian ini menekankan pentingnya mengintegrasikan prinsip keadilan dan kesetaraan ke dalam kerangka konservasi untuk mencapai hasil yang tidak hanya secara ekologis berkelanjutan tetapi juga secara sosial adil. Secara konseptual, karya ini berkontribusi pada debat kritis di persimpangan tata kelola lingkungan dan keadilan sosial. Secara praktis, ia memberikan panduan bagi pembuat kebijakan untuk merancang strategi konservasi yang lebih responsif terhadap konteks, partisipatif, dan berbasis hak. Singkatnya, temuan ini menegaskan bahwa konservasi berkelanjutan tidak dapat dicapai tanpa inklusi yang bermakna dan penghormatan terhadap klaim historis dan budaya.

Kata kunci: Konservasi Lingkungan, Ketimpangan Sosial, Zona Penyangga, Studi Kasus Perbandingan, Keadilan dan Partisipasi

1. Introduction

Buffer zones around conservation areas have long been positioned as strategic spaces to bridge environmental conservation interests with the socio-economic needs of local communities. Theoretically, these areas serve as ecological shields and arenas for sustainable development. In practice, however, the conservation approach applied in buffer zones often creates new social inequalities, especially regarding the distribution of conservation benefits and costs (Spiteri & Nepal, 2008).

These inequalities take various forms, from reduced access to natural resources, forced displacement of traditional communities, to the dominance of external actors in conservation governance. Cross-country studies show that non-inclusive conservation has the potential to deepen marginalization, especially of the poor, women and indigenous peoples. In contrast, community-based conservation initiatives and participatory mechanisms have shown more equitable and sustainable outcomes (Dawson et al., 2021, 2024; Green & Healy, 2022; Vehrs & Zickel, 2023).

Nonetheless, there is still a gap between conservation policies and the reality on the ground. Some policies tend to be technocratic and top-down, ignoring local dynamics and complex power relations within communities (Budhathoki, 2004). It is ironic that conservation intended for sustainability creates social exclusion and new structural inequalities.

In the context of 2025, the urgency to formulate a more equitable conservation model has come to the fore, along with increasing pressures on biodiversity and the climate crisis. Recent research shows that the effectiveness of protected areas is not only determined by ecological parameters, but also by how benefits and decision-making processes are socially distributed (Oldekop et al., 2016). Integrating social justice dimensions into conservation strategies is therefore a normative and empirical imperative.

The novelty of this research lies in its cross-case approach that not only identifies global patterns, but also elaborates on the specific social-ecological contexts that influence how such inequalities materialize. By placing equity as a central principle in conservation, the findings provide a conceptual and empirical basis for reformulating buffer zone policy design to be more inclusive, equitable and sustainable.

This study aims to critique the dynamics of social inequality in conservation practices in buffer zones using a cross-case comparative approach. By examining studies from various regions including Asia, Sub-Saharan Africa and Latin America, it offers critical reflections on contemporary conservation policies and opportunities towards more inclusive and transformative conservation. How do conservation approaches in buffer zones reproduce or mitigate social inequality across varied global contexts.

2. Method

This study adopts a qualitative-comparative approach, employing a comparative case study design to explore how conservation practices in buffer zones influence social inequality. This methodological choice allows for an in-depth, context-sensitive analysis of diverse experiences across ecological, political, and socio-cultural settings, rather than aiming for statistical generalization (Yin, 2018).

Ten case studies were purposively selected based on four criteria: (1) the area lies within a buffer zone of a formally recognized conservation site; (2) there is documented evidence of social inequality or conflict; (3) cases represent geographical diversity across Asia, Sub-Saharan Africa, and Latin America; and (4) each case is drawn from peer-reviewed journals or reputable policy reports. Examples include Chitwan National Park (Nepal), Nyungwe (Rwanda), Mount Elgon (Uganda), Calakmul (Mexico), and conservation landscapes in India, Namibia, and the South Caucasus.

Data were collected through a systematic literature review using Scopus and Web of Science, supplemented by relevant publications from international agencies such as IUCN and UNDP. Search terms included "buffer zones," "conservation and inequality," "protected areas and communities," and "environmental governance and justice." From this literature, five core analytical variables were identified to guide case comparison: (1) distribution of conservation-related benefits and burdens; (2) access to natural resources; (3) economic dependency on conservation zones; (4) participation in conservation decision-making; and (5) governance structures and institutional responses. These variables are summarized in Table 1 below to serve as a synthesis guide across cases.

Table 1. Five Analytical Variables Used Across Case Studies

No	**Variable**	**Description**
1.	Distribution of Benefits and Burdens	Examines how conservation-related gains and losses are distributed across different social groups.
2.	Access to Natural Resources	Considers local communities' ability to access land, water, forests, and other natural assets following conservation implementation.
3.	Economic Dependency	Looks at the degree to which local populations depend on conservation-related resources for livelihoods.
4.	Participation in Decision-Making	Analyzes whether and how local people, especially marginalized groups, are involved in conservation planning and governance.
5.	Governance and Institutional Response	Evaluates the legal, institutional, and policy frameworks shaping conservation practices and community relations.

Data analysis was conducted using a three-phase thematic coding strategy: open coding to identify emerging patterns; axial coding to link patterns with conceptual categories; and selective coding to construct a cross-case narrative. Both within-case and cross-case analysis were employed to examine how structural and contextual conditions shape inequality. Source triangulation was used to enhance validity by cross-referencing multiple publications per case and maintaining analytical reflexivity throughout the process (George & Bennett, 2005).

While this study relies entirely on secondary sources, efforts were made to ensure rigor through careful source selection, transparent coding protocols, and critical engagement with the literature. The absence of primary data constitutes a limitation, particularly regarding current ground-level dynamics. Nevertheless, the comparative insights produced here offer a robust foundation for further empirical research and for developing more socially responsive conservation policies.

3. Result and Discussion

In order to enhance comprehension of the manner in which social inequalities are expressed in conservation practices within buffer zones, this research study has undertaken a comparative analysis of twelve case studies from multiple countries. Each case was selected based on academic documentation demonstrating the tension between conservation objectives and the socio-economic conditions of local communities. Table 2 below summarizes the location, key findings and references of each case study. By presenting findings across geographic and policy contexts, the table provides a comprehensive picture

of the forms of injustice that emerge, ranging from unequal distribution of benefits, restricted access to resources, to lack of community participation in decision-making. This information provides an important foundation for identifying global patterns and local variations in the relationship between environmental conservation and social inequality.

Table 2. Case Study Comparison

No.	Region/ Case Study	Key Findings on Inequality	Citation
1.	Nepal (Chitwan National Park Chitwan National Park) Inequality	Uneven distribution of benefits, with villages further from tourist areas receiving fewer benefits..	(Dixit et al., 2024; Spiteri & Nepal, 2008)
2.	Uganda (Mt.Elgon National Park receiving fewer benefits)	Wealthier individuals and elites benefit more from conservation incentives.	(Jeha, 2016)
3.	Rwanda (Nyungwe National Park)	Privatization reduces access to resources for poor households.	(Gross-Camp et al., 2015)
4.	Nepal (Poor region. Conservation Marginalized groups Annapurna)	Marginalized groups have minimal representation in decision making.	(Dahal et al., 2014)
5.	Zambia (Valley decision-making. Luangwa)	Weak governance and unequal power dynamics perpetuate inequality.	(Nyirenda & Chomba, 2015)
6.	Mexico (Reserve inequality. Calakmul Biosphere Reserve)	Women's involvement improves livelihoods but not necessarily equality.	(Radel, 2012)
7.	India (Ancient National Park but not necessarily equality)	The displacement of indigenous peoples eliminates traditional livelihoods.	(Mahalwal & Kabra, 2023)
8.	Namibia (Zambezi)	Historical injustices and displacement contribute to ongoing inequalities.	(Vehrs & Zickel, 2023)
9.	Zimbabwe (district Ongoing. Beitbridge)	Unequal distribution of benefits and lack of participation in CAMPFIRE.	(Dhliwayo et al., 2023)
10.	South Caucasus	Economic impoverishment and competition over land use exacerbate inequality.	(Kalatas, 2016)
11.	Nepal (Parks exacerbates inequalities. National Need for inclusive practices Sagarmatha)	The need for inclusive practices and compensation schemes to reduce inequalities.	(Silwal et al., 2022)
12.	Mexico (Nevado de reduce inequalities. Toluca)	Participatory monitoring and community empowerment are essential.	(Caro Borrero et al., 2024)

A case study from Chitwan National Park in Nepal highlights how the distribution of conservation benefits is often geographically uneven. Villages located closer to tourist destinations receive more economic benefits, while villages further away receive fewer

benefits. This suggests that tourism-based conservation can reinforce spatial and economic inequalities between local communities. When planning does not take into account aspects of distributional justice, conservation can create new injustices, instead of improving the social-ecological conditions of surrounding communities.

The unequal distribution of benefits from tourism in Chitwan National Park, Nepal, reveals significant differences between villages based on their proximity to tourist areas. Although conservation initiatives are designed to provide economic incentives to local communities, communities located further away from tourist centers often receive very limited benefits. This situation raises concerns regarding equity and effectiveness of incentive-based programs.

Villages closer to tourist entrances tend to derive greater economic benefits from tourism, while those further away receive only limited benefits (Spiteri & Nepal, 2008). Participation in the tourism sector is positively correlated with the level of benefits received; individuals working in the tourism industry benefit the most (Spiteri & Nepal, 2008). Protected areas have been shown to contribute to general poverty reduction, yet the distribution of benefits remains unequal, with very limited spillover effects to surrounding areas (den Braber et al., 2018).

Governance of protected areas often benefits elite groups, while marginalized communities have limited access to tourism benefits (Paudel, 2016). Inequalities at the local level are exacerbated by distance to tourism infrastructure, with wealthier households earning a larger share of tourism revenues (Bennike & Nielsen, 2024). While these challenges remain, some progress has been made in efforts to distribute benefits more equitably in the buffer zone of Chitwan National Park. However, continuing inequalities point to the need for further reforms in governance and resource management systems to ensure that all communities can enjoy the benefits of tourism.

In Uganda, particularly around Mount Elgon National Park, research shows that wealthier individuals and local elites tend to be better able to access incentives from conservation programs. This phenomenon suggests the existence of "elite capture" in incentive-based conservation systems, such as payment for environmental services (PES) schemes. This access gap creates inequality that disadvantages the poor and reinforces economic inequality in the long run.

The issue of wealthier individuals and elite groups benefiting more from conservation incentives in Uganda, particularly in Mount Elgon National Park, is complex. Although conservation initiatives are designed to improve the livelihoods of local communities, evidence suggests that the distribution of benefits often favors those with more resources. This inequality raises concerns about equity in conservation policy.

Collaborative arrangements introduced since the 1990s, such as resource access agreements and revenue sharing from tourism, have resulted in only marginal increases in income for local households - on average around 1.2% of total income (Vedeld et al., 2016). In contrast, costs associated with conservation, including evictions and restrictions on access to resources, can account for more than 20% of household income, disproportionately burdening the poor (Vedeld et al., 2016).

Research shows that individual performance-based payments (PBIPs) produce better conservation outcomes compared to community-based payments (CBPs) and equity-based individual payments (EBIPs) (Gatiso et al., 2018). However, these payment schemes often favor economically established individuals, potentially exacerbating inequalities within communities (Gatiso et al., 2018).

Although payment for environmental services (PES) schemes do not significantly change resource-sharing practices, they encourage the emergence of stronger social norms for sharing among landowners, showing some positive social outcomes despite initial inequalities (Vorlaufer et al., 2023). Conversely, while conservation incentives can benefit wealthier individuals, they also have the potential to have unintended consequences by marginalizing poorer communities. This highlights the need for more equitable conservation policies that address the needs of all stakeholders.

Rwanda's Nyungwe National Park presents a case of conservation privatization reducing poor households' access to natural resources. With privatization policies in place, local communities' access rights to their traditional forests and resources are limited. This reinforces structural exclusion and worsens the welfare conditions of the poor, especially those who depend on direct access to nature.

The privatization of Nyungwe National Park's buffer zone has significantly limited poor households' access to critical resources, as highlighted in multiple studies. Changes in management practices, particularly with the involvement of the New Forest Company, have

led to stricter enforcement of rules and reduced opportunities for local communities to access resources. This has further exacerbated their dependence on the park as a source of income and subsistence (Gross-Camp et al., 2015).

Poor households rely heavily on timber from the buffer zone, which accounts for a large proportion of their income. The privatization process led to stricter surveillance and access control, making it difficult for local residents to gather the needed resources (Gross-Camp et al., 2015). Although tourism revenue-sharing schemes have been introduced to benefit local communities, these initiatives have not been sufficient to replace the loss of access to natural resources (Akayezu et al., 2022; Snyman et al., 2023).

Many community members report dissatisfaction with income-sharing schemes, stating that the benefits received are not worth the economic losses due to restricted access to resources (Imanishimwe et al., 2019). However, there is a view that revenue-sharing programs can improve community welfare in the long term if managed effectively, demonstrating the potential for positive outcomes despite current challenges (Snyman et al., 2023; Akayezu et al., 2022).

Meanwhile, in Nepal's Annapurna Conservation Area, the issue of under-representation of marginalized groups in conservation decision-making processes was raised. Despite being managed with a community-based conservation approach, the governance structure is still controlled by dominant groups. This underrepresentation of minority groups in deliberative forums poses a risk of non-inclusive policies and leads to deeper marginalization.

Representation of marginalized groups in decision-making processes in the Annapurna Conservation Area (ACA), Nepal, remains very limited, leading to significant gaps in participation and empowerment. Research shows that although groups such as women, low caste and landless individuals participate in local management institutions, their influence remains limited due to various socio-political barriers (Baral et al., 2025). Individuals from these groups tend to participate less in decision-making forums compared to men and more privileged members, due to competing responsibilities, lack of incentives, and feelings of powerlessness (Baral et al., 2025).

Furthermore, the benefits of conservation initiatives are not evenly distributed, with marginalized groups often receiving fewer benefits (Schuett et al., 2016). This emphasizes

the need for a more inclusive approach to conservation strategies, rather than relying solely on quotas (Dahal et al., 2014). One potential solution that is beginning to show positive results is ecotourism, which can improve social equity and economic opportunities for marginalized groups, while encouraging their participation in decision-making (Tiwari & Nguyen, 2024). However, without systemic changes that address these underlying barriers, marginalized groups will continue to experience significant difficulties in influencing decisions related to conservation and development in ACA.

Conditions in Zambia, particularly in the Luangwa Valley, demonstrate how weak governance and unbalanced distribution of power can exacerbate inequalities in conservation. When there is a lack of transparency and accountability in decision-making, conservation programs tend to be controlled by actors with greater power, both economic and political. This creates structural inequalities that are difficult to correct without institutional reform.

Zambia's Luangwa Valley is a clear example of how weak governance and power imbalances can reinforce social inequality. Despite the country's economic growth, income distribution remains highly unequal. Poor households depend on agricultural self-employment and experience limitations in accessing wage income, which in turn exacerbates inequality (Bhorat et al., 2022). Governance issues are further complicated by power imbalances in decision-making processes, where marginalized groups often lack adequate representation (Siangulube et al., 2023). Furthermore, the interaction between customary governance systems and formal governance creates unstable structures, which deepen inequities, particularly in the context of land rights. The shift towards private land ownership has created clandestine markets that benefit a few, while excluding women and other vulnerable groups from access to resources (Sitko, 2010). Nevertheless, there is an optimistic view that recent political changes, such as the peaceful transition of power in 2021, could pave the way for improved governance and reduced inequality, and point to the potential for reform in Zambia's political landscape.

In Calakmul Biosphere Reserve, Mexico, women's increased participation in conservation activities has not translated into real gender equality, as they remain marginalized in decision-making and access to resources. This underscores the limitations of normative conservation approaches in driving structural change. Women's involvement

in agricultural organizations has indeed encouraged the development of gendered livelihood strategies, shaped through negotiations within However, while these strategies make room for women's roles, they still face barriers to accessing resources and decision-making power, suggesting that participation alone is not enough to ensure equality (Sumner et al., 2014). Alliances between conservationists and women's community organizations have been partially successful in improving women's well-being and conservation outcomes (Radel, 2012). However, such alliances often fail to address deeper systemic issues, such as restrictive cultural norms and resource limitations, that continue to perpetuate women's marginalization (Eswaran et al., 2025).

Therefore, conservation approaches that view gender simply risk maintaining inequitable practices, and require a deeper understanding of gender dynamics and power relations (Lau, 2020). Approaching conservation through feminist political ecology can provide important insights into these challenges and promote true gender equality in conservation initiatives. Despite increasing recognition of women's roles in conservation, persistent structural inequalities suggest that participation alone is not enough to realize gender equality in Calakmul Biosphere Reserve.

India presents a complex case of Ancient National Parks, where relocation of communities for conservation purposes has eliminated their traditional livelihoods. Forced displacement without a sustainable livelihood scheme negatively impacts the well-being of the community. This highlights the importance of a human rights approach in conservation planning, where recognition of traditional livelihoods and land rights are essential elements.

The issue of forced displacement for conservation purposes in India's national parks has posed serious challenges for local communities, particularly in relation to the loss of their traditional livelihoods. Experiences from various protected areas, such as the Ancient National Park and the Sariska Tiger Reserve, demonstrate the negative impacts of top-down conservation approaches that ignore the rights and needs of relocated populations. Displacement from protected areas often leads to the loss of traditional livelihoods, as seen in Kuno National Park, where rehabilitation efforts have been inadequate. The case of the Sariska Tiger Reserve shows how local communities have very limited influence over the relocation process, resulting in socio-cultural disruption and loss of access to natural resources (Torri, 2011). While the Forest Rights Act (FRA) is designed to protect the rights

of forest-dwelling communities, its implementation is inconsistent and often fails to prevent unauthorized relocations (Fanari, 2019).

Results and discussion Therefore, a collaborative conservation approach that respects local rights and integrates community needs is critical to achieving sustainable outcomes (Torri, 2011). On the other hand, there are those who argue that relocation is necessary for biodiversity conservation. However, if the rights and livelihoods of affected communities are not accommodated, such conservation measures may have long-term adverse socio-economic and ecological consequences.

Historical injustices rooted in colonialism and forced displacement in Namibia's Zambezi Region have created inequalities that persist today, affecting land distribution and access to resources. This legacy is a major obstacle to contemporary conservation efforts as it often ignores the needs and rights of marginalized communities. Reparative approaches are critical to addressing these inequities and ensuring that conservation practices are equitable and inclusive. The Zambezi region has a complex history of settlement, where many communities experienced displacement during the establishment of conservation areas such as Mudumu National Park. These displacements sparked ongoing protests from affected families, who demanded recognition of their ancestral land rights (Vehrs & Zickel, 2023). Colonial policies have created structural inequalities in land ownership, which still favor those who previously benefited from colonial dispossession (Melber, 2019). Conservation initiatives that do not consider historical injustices risk reinforcing exclusion and deepening inequality.

Therefore, today's conservation strategies must integrate the voices and rights of historically marginalized groups to achieve effectiveness (Vehrs & Zickel, 2023). Failing to address these inequities has the potential to create greater social tensions and hinder the process of sustainable development in the region (Jauch & Tjirera, 2017). While some argue that conservation can be achieved through community engagement and the distribution of shared benefits, this view risks ignoring entrenched inequalities that require immediate reparative action. Addressing historical injustices is therefore an essential step towards creating true equity in conservation practice.

The CAMPFIRE program in Zimbabwe, particularly in the Beitbridge district, is an example of community-based conservation aimed at empowering local communities through

wildlife management. However, its implementation has revealed significant inequalities in the distribution of benefits. While the program is theoretically designed to empower communities, the reality on the ground is that local elites, including political figures and safari operators, tend to dominate the economic benefits of CAMPFIRE. This leaves ordinary community members, including ethnic groups such as the Doma, marginalized from decision-making processes and access to benefits (Jani et al., 2024).

This inequality highlights the importance of inclusivity as a key to success in community-based conservation. In addition, the current governance structure that only gives authority to rural district councils has limited local communities' direct control over resources. To address this imbalance, greater devolution of authority is needed so that communities living alongside wildlife can have greater control and benefit fairly and effectively. Exclusionary practices that exclude non-member communities from access to benefits not only create a sense of injustice, but also risk fueling resentment and sabotage of conservation efforts, as noted in the Zambezi Valley. This undermines the very purpose of sustainable resource management and community empowerment (Dzingirai, 2003). Nevertheless, some argue that the CAMPFIRE program has succeeded in raising awareness and participation in conservation among some community members, suggesting that despite serious challenges, there are still positive outcomes that can serve as a basis for strengthening inclusiveness going forward.

The South Caucasus region faces complex conservation challenges, exacerbated by economic impoverishment and conflicts over land use. The establishment of protected areas in the region often provokes resistance from local communities who depend on the land for their subsistence needs, highlighting the urgency of integrated mitigation strategies that address existing social inequalities. Without such a strategy, conservation efforts can actually exacerbate social conflicts, as land becomes a contested resource between conservation goals and people's livelihood needs. The collapse of the Soviet system has left many rural communities in a state of poverty, making subsistence farming the main survival strategy (Kalatas, 2016). In this context, the establishment of protected areas is often accompanied by restrictions that threaten community survival, triggering resistance to conservation initiatives. Conservation conflicts in these regions cannot be separated from their deep social,

cultural and political roots, requiring a multi-dimensional approach to conflict management (Hodgson et al., 2021).

Effective conflict resolution requires recognizing common problems and engaging all stakeholders transparently to negotiate mutually acceptable solutions (Redpath et al., 2013). Bottom-up participatory conservation approaches can foster trust and collaboration among stakeholders, and potentially defuse conflicts (Reed et al., 2015). However, this approach must be carefully designed to ensure fair representation and avoid creating new tensions (Reed et al., 2015). Conversely, there is also a view that even when intended for good, poorly conceived conservation initiatives can inadvertently reinforce inequalities and exacerbate existing conflicts. This demonstrates the complexity of balancing ecological objectives with social justice in conservation practice.The Sagarmatha National Park case study highlights the importance of inclusive conservation practices, which emphasize community engagement and compensation schemes to reduce inequalities. Effective conservation models must be sensitive to local needs and respect cultural contexts, so that biodiversity and community livelihoods can be protected in a balanced way. This approach not only fosters sustainable practices, but also increases the chances of conservation success in the long term. The active involvement of local communities in conservation initiatives has been shown to produce more positive outcomes. In the Khumbu region, for example, community engagement has been instrumental in supporting sustainable tourism (Chen et al., 2025). In addition, the implementation of compensation schemes for damage caused by wildlife is an important element in supporting local participation. However, the buffer zone program in Sagarmatha shows gaps in accommodating local needs, especially in terms of compensation for crop damage (Silwal et al., 2022). The integration of local practices into conservation strategies, such as the preservation of "Nawa" animals, can increase support and conservation effectiveness at the community level (Silwal et al., 2022). Sustainable ecotourism should also be aligned with the values and cultural practices of local communities to prevent environmental degradation and ensure equitable distribution of benefits (Bhatta & Chan, 2023). While an inclusive focus on conservation is essential, it should also be recognized that external pressures, such as increased tourism and population growth, can make it difficult to balance conservation and community needs. Therefore, a holistic approach to

addressing these multifaceted issues is critical to achieving sustainable development in Nepal's protected areas (Gurung, 1993).

Community participation and community-based monitoring in the Nevado de Toluca area play a key role in both effective conservation and local empowerment. This approach not only strengthens protected area management, but also promotes social and ecological justice by integrating local knowledge and needs into conservation strategies. Involving local communities in conservation efforts can strengthen their capacity to manage natural resources sustainably (Caro Borrero et al., 2024). In addition, community-based monitoring helps align government conservation policies with the realities faced by local communities, ensuring more equitable access to resources (Ortega-Álvarez et al., 2017). Other benefits of this approach include improved community skills and knowledge in monitoring biodiversity, which can support better decision-making in resource management (Ortega-Álvarez et al., 2017). Sustained engagement is also important, as successful monitoring initiatives rely heavily on long-term participation that builds deep connections between communities and their ecosystems (Gómez-Ortiz et al., 2024). While the benefits are clear, challenges remain, including a lack of support for community initiatives and the risk of excluding local voices in decision-making processes (Caro Borrero et al., 2024). Overcoming these challenges is crucial to realizing true social and ecological justice in conservation practice.

4. Conclusion

This study sought to answer two central questions: how do conservation approaches in buffer zones reproduce or mitigate social inequality across varied global contexts, and what forms of governance can effectively reduce these disparities? Through a comparative analysis of twelve case studies, we found consistent patterns of injustice embedded in buffer zone conservation practices. These include elite capture, unequal distribution of benefits, restricted access to resources, and limited participation of marginalized groups in decision-making. Such outcomes are frequently the result of top-down conservation policies that overlook the complex historical and socio-political dynamics of local communities. The findings demonstrate that conservation efforts designed without an explicit commitment to equity tend to reinforce rather than resolve existing inequalities.

However, some cases offer hopeful alternatives. Initiatives in areas such as Nevado de Toluca and Sagarmatha show that participatory monitoring, community-based ecotourism,

and culturally grounded practices—when supported by legal recognition and institutional commitment—can help mitigate disparities. Yet these efforts often remain partial and fragile without broader structural reforms. Therefore, to promote more equitable and sustainable conservation outcomes, we propose several evaluation-based policy recommendations anchored in measurable indicators. First, equitable benefit distribution should be tracked using indicators such as the Gini index of conservation-related income, with a goal of reducing intra-community inequality by at least 25% over five years. Second, inclusive decision-making can be monitored by assessing the proportion of marginalized groups women, indigenous people, and the poor in conservation governance structures, aiming for at least 40% representation. Third, recognition of customary land rights should be a legal priority, with a target of securing formal acknowledgment in at least 75% of buffer zones. Fourth, governance frameworks should include transparent, community-led monitoring and grievance mechanisms, to be implemented across all buffer zones within three years. Finally, assessment tools such as the IUCN Equity Framework or the Social Assessment for Protected Areas (SAPA) should be applied regularly, with a minimum benchmark of 75% on participatory equity scores across conservation sites by the fifth year.

While this study is limited by its reliance on secondary sources, it offers an empirically grounded synthesis that advances both scholarly understanding and policy discourse. Future research should integrate mixed-method approaches and prioritize participatory inquiry involving community co-researchers to capture lived experiences and evaluate the impact of reform efforts. In conclusion, conservation in buffer zones cannot succeed if it perpetuates the very inequalities it claims to alleviate. Embedding principles of equity, recognition, and genuine participation into the heart of conservation governance is not only necessary for social justice but fundamental to the long-term viability of ecological protection efforts.

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