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**Beyond Protected Areas: A Systematic Literature Review of  
Social–Ecological Dynamics in Namibia’s Kunene Region**



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## Beyond Protected Areas: A Systematic Literature Review of Social–Ecological Dynamics in Namibia’s Kunene Region

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### Abstract

**Purpose:** This systematic literature review examines the social-ecological dynamics shaping conservation outcomes beyond formal protected areas in Namibia’s Kunene Region. It specifically explores how communal and multi-use landscapes surrounding national parks contribute to wildlife movements, ecological connectivity, biodiversity conservation, and pastoralist livelihoods.

**Methodology:** The study employed a systematic literature review approach, synthesizing empirical studies published over the past three decades. The review focused on key social-ecological factors influencing landscape functionality, including governance structures within communal conservancies, human-wildlife interactions, land-use changes, local institutional capacity, and the role of traditional knowledge in conservation management.

**Findings:** The findings indicate that effective conservation beyond protected areas depends on strong local institutions, cross-boundary coordination, and integration of traditional knowledge. However, varying conservancy capacity, livelihood pressures, human-wildlife interactions, and habitat fragmentation constrain long-term resilience. The review demonstrates that “in-between spaces” connecting national parks are vital for ecological connectivity and sustainable livelihoods.

**Unique Contribution to Theory, Practice and Policy:** The review advances conservation theory through a social-ecological systems perspective, emphasizing interactions among ecosystems, institutions, livelihoods, and land use. Practically, it promotes inclusive, adaptive, landscape-scale conservation and stronger communal conservancies. Policy recommendations include strengthening institutional capacity, enhancing cross-boundary governance, integrating traditional knowledge, reducing livelihood pressures, and formally recognizing conservation corridors and multi-use landscapes within national conservation planning.

**Key Words:** *Landscape-scale conservation, Social–ecological systems, Ecological connectivity, Community-based natural resource management (CBNRM), Conservancies, Human–wildlife interactions*

## 1.0 Introduction

Conservation systems around the world have long relied on national parks as the primary means of protecting biodiversity, yet these areas represent only a fraction of the landscapes wildlife depends on. Many species move across human-dominated spaces, seasonal grazing areas, and communal lands beyond formal conservation boundaries. As climate variability intensifies and habitats become increasingly fragmented, these “in-between spaces” are gaining prominence as essential components of ecological networks and climate-resilient conservation strategies (Hällfors et al., 2025). Despite their importance, they often receive limited research attention, leaving unanswered questions about how ecological processes unfold across mixed-use landscapes and how conservation can be effectively supported beyond the confines of national parks (Jones et al., 2021).

Namibia provides a unique setting to explore these questions, particularly because of its community-based natural resource management (CBNRM) system. Since the early 1990s, Namibia has progressively devolved wildlife-management and tourism rights to communities living on communal land, culminating in the 1996 Nature Conservation Amendment Act, which enabled communal conservancies to manage and benefit from wildlife and tourism within defined areas (Jones, 2011). This approach has expanded the conservation estate across vast communal areas and has contributed to wildlife recovery and improved governance capacity (Boudreaux & Nelson, 2011). The Kunene Region, situated in northwestern Namibia, exemplifies this landscape-scale conservation model. Its rugged desert environment supports elephants, black rhinos, carnivores, and ungulates that rely heavily on mobility across wide areas. Many of their seasonal routes and corridors lie outside protected zones such as Etosha and Skeleton Coast National Parks, making the surrounding conservancies and communal lands crucial for maintaining movement pathways and ecological connectivity (Naidoo et al., 2016).

Yet these same landscapes also support pastoralist communities whose livelihoods depend on flexible grazing strategies and access to scarce natural resources. Interactions between people and wildlife are shaped by drought, land-use decisions, local governance structures, and economic opportunities tied to conservation and tourism. These overlapping pressures underscore the complexity of sustaining biodiversity where human activities and ecological processes occur simultaneously. The central problem addressed in this literature review is that the ecological functions and governance dynamics of the areas situated between national parks in the Kunene Region remain insufficiently understood, creating barriers to designing effective, inclusive conservation strategies that operate across the wider landscape.

To address this gap, the first objective of the literature review is to investigate how these interstitial spaces contribute to ecological connectivity, with particular attention to wildlife movement patterns and habitat use outside protected areas. The second objective is to examine how community governance, land-use practices, and local livelihood activities influence conservation outcomes within these shared landscapes. By focusing on both ecological and social dimensions, the literature review seeks to provide insights that can inform integrated

conservation planning in Namibia and other regions where biodiversity persists within multi-use environments. In doing so, it highlights the importance of recognizing and supporting the spaces beyond protected areas as vital components of contemporary conservation practice.

## 2.0 Literature Review

Recent conservation research emphasizes the importance of locally led institutions in achieving sustainable biodiversity outcomes. Conserve Global (CG) exemplifies this approach by supporting collaborative, landscape-focused strategies that build on existing social–ecological systems rather than imposing external management. In Namibia’s Kunene Region, a mosaic of communal lands, tourism concessions, and protected areas provides critical habitat for desert-adapted wildlife while supporting pastoralist communities. Maintaining connectivity across these lands is essential for species survival, yet human activities such as fencing, settlement expansion, and rangeland development can disrupt movement patterns. At the same time, social factors including human-wildlife conflicts, livelihood needs, and governance arrangements play a crucial role in shaping conservation success. Although protected areas and conservancies have expanded, fragmentation and resource pressures persist, highlighting the need for integrated planning that links ecological connectivity with inclusive, locally supported governance strategies.

Table No 1 Key literature

| SN | Theme                                          | Authors/Year           | Focus                                         | Key Insights                                                                                        |
|----|------------------------------------------------|------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1  | Multi-User Landscape & Ecological Connectivity | Lindsay et al (2022)   | Wildlife use of areas outside protected zones | Multiuser landscape, rangeland under climate vulnerability                                          |
|    |                                                | Naidoo et al 2021      | Community-Based Natural Resources Management  | Leadership Capacity                                                                                 |
| 2  | Buffer zones and in-between spaces             | Hilty et al, 2020      | Ecological corridors                          | Corridors maintain gene flow and predator-prey dynamics                                             |
| 3  | Institutional strengthening and Governance     | Kavhu et al, 2023      | Wildlife movement in arid landscapes          | Desert adapted species require flexible movement across communal and protected lands                |
|    |                                                | Johnson et al 2020     | Human-wildlife interactions                   | Conflicts from predation, water competition and crop damage                                         |
|    |                                                | Wolfaardt et al (2024) | Land use and land cover change                | Protected expansion alone is not enough                                                             |
| 4  | Research Gaps                                  | Various                | Social-ecological integration                 | Limited studies examine the interaction of wildlife movement with governance and land-use practices |

## 2.1 Ecological Importance of Multi-Use Landscapes

Growing interest in landscape-level conservation has shifted scholarly attention toward areas lying outside formal protected boundaries. Researchers now argue that these multi-use

landscapes, including communal lands, private rangelands, and informal corridors are increasingly important for maintaining ecological connectivity as species adjust their movements in response to climate variability and human pressures. Recent studies emphasize that wildlife frequently depends on habitats beyond protected areas for seasonal migrations, dispersal, and access to scarce resources, especially in dryland ecosystems where environmental conditions are highly variable (Lindsey et al., 2022). This expanding body of work highlights the need to better understand the ecological roles of unprotected landscapes, as well as the human governance systems that shape them. One of the most prominent examples of conservation beyond protected areas is Namibia's community-based natural resource management (CBNRM) program. Over the past three decades, communal conservancies have emerged as key governance institutions that allocate rights over wildlife and tourism benefits to local residents. The literature generally acknowledges that this system has contributed to positive trends in wildlife recovery, strengthened community participation, and diversified rural livelihoods (Naidoo et al., 2021).

At the same time, scholars caution that governance effectiveness varies widely across conservancies, and outcomes are shaped by factors such as leadership capacity, local decision-making processes, and access to external support from governments or NGOs.

## **2.2 The Functional Importance of Corridors, Buffer Zones, and In-Between Spaces**

Conservation landscapes are defined by more than just the boundaries of national parks and formally protected regions. In much of Sub-Saharan Africa, the most important biological and social processes take place in the enormous in-between spaces the corridors, buffer zones, and communal rangelands that surround, link, and support the protected core. These landscapes serve as the connective tissue of conservation systems, allowing species to travel, sustaining rural livelihoods, and underpinning local participation-based governance approaches. Understanding their functional worth is therefore critical when developing conservation policies that are resilient, inclusive, and ecologically cohesive.

### **Ecological Benefits of In-Between Spaces**

Ecological corridors serve a critical role in landscape integrity. They promote gene flow across wildlife populations, maintain predator-prey dynamics, and allow species to adjust their ranges in response to climatic change. Hilty et al. (2020) argue that connectivity is even more important in dry locations because water and fodder are unevenly distributed in space and time. Ecological factors such as ephemeral rivers, scattered water sites, mountain passes, and seasonal grazing basins all have a significant impact on the operation of these corridors in Kunene. These components serve as anchors for both wildlife and livestock migrations, resulting in fluid patterns of use that vary with rainfall cycles, drought conditions, and resource availability. In this regard, in-between spaces are not inactive places between parks; rather, they are live ecological systems that act as the arteries and veins of larger conservation landscapes. Without them, protected areas risk becoming isolated biological islands that cannot support viable wildlife populations or adapt to the rising effects of climate change. Kunene

demonstrates that the health of the "matrix" surrounding parks frequently determines whether regional biodiversity can be sustained in the long run.

### **Governance, Livelihoods, and Social Function**

The usefulness of in-between areas goes far beyond their ecological role. These landscapes are also social, economic, and governance venues where communities negotiate access, manage resources, and establish the institutional foundations necessary for long-term conservation success. In Kunene, communal conservancies have become nuclei for a variety of livelihoods, including community-based tourism, women-led entrepreneurship ventures, and wildlife-friendly value chains. Pastoral mobility remains an important function, and rotational grazing promotes rangeland health while also maintaining livestock the foundation of rural livelihoods.

### **2.3 Conserve Global's Approach: Strengthening Institutions in Communal Landscapes**

Conserve Global (CG) presents itself in African conservation as a facilitator of robust, locally anchored institutions rather than an outsider management attempting to seize control of landscapes.

Its strategy is intentionally landscape-oriented and partnership-based, reflecting the growing agreement that conservation solutions are best sustainable when they arise from functional social-ecological systems rather than top-down management institutions. Within Namibia, the Kunene Region has attracted increasing research attention due to its distinct ecological and social characteristics. The area supports desert-adapted elephants, black rhinos, and carnivores that must navigate a patchwork of communal lands, tourism concessions, and protected areas. Studies in similar arid landscapes show that wildlife relies heavily on movement flexibility to cope with unpredictable rainfall and resource availability, making connectivity among land parcels vital to species persistence (Kavhu et al., 2023). However, human activities such as rangeland expansion, settlement growth, and the construction of fences have been shown to interrupt movement routes in several parts of southern Africa. This raises concerns about how changing land use in Kunene may affect long-term wildlife mobility.

The social dimensions of these shared landscapes are equally complex. Research on human–wildlife coexistence in Namibia suggests that conflicts arise from livestock predation, competition for water, and crop damage, with pastoralist households bearing most of the associated costs (Johnson et al., 2020). These costs can weaken community support for conservation unless they are offset by meaningful economic incentives, equitable benefit-sharing, and inclusive governance structures. As a result, scholars increasingly advocate for governance models that combine ecological knowledge with local livelihood priorities, recognizing that conservation success outside protected areas depends on social legitimacy and community trust. Recent analyses of land-use and land-cover change (LULCC) further underscore the importance of integrated landscape planning. While expansions of protected areas and conservancies have increased the amount of land formally dedicated to conservation, studies show that fragmentation and localized degradation continue to threaten ecological connectivity in Namibia's drylands (Wolfaardt et al., 2024).

These findings suggest that establishing new protected zones is not sufficient on its own; effective conservation requires coordinated planning across the entire landscape, including areas managed for livestock, tourism, or mixed livelihoods. Despite the growing literature, important gaps remain. Most existing studies focus on either ecological connectivity or community governance, but relatively few examine how these two dimensions interact in arid, multi-use settings such as Kunene. There is also limited empirical work detailing how movement patterns of desert-adapted species align with local land-use practices and governance structures. These gaps highlight the need for research that integrates ecological and social perspectives to better understand how the spaces between national parks contribute to regional conservation goals.

### **3.0 Discussion**

This review set out to investigate how the spaces linking national parks in Namibia's Kunene Region function ecologically and socially. The findings reinforce a key insight emerging across conservation science: biodiversity in dryland environments is sustained not only by protected areas but also by the vast communal and multi-use lands that surround them. These areas support critical ecological processes while simultaneously hosting pastoralist livelihoods, creating a complex and interdependent system that must be understood as a whole. By examining patterns of wildlife movement alongside community governance and land-use practices, this research contributes to a more integrated picture of landscape-level conservation.

#### **Ecological Importance of the Areas Between Parks**

The literature review shows that desert-adapted wildlife relies heavily on the ability to move across large, heterogeneous landscapes. Seasonal migrations and dispersal pathways frequently lead animals through conservancies, grazing zones, and communal rangelands far beyond formal park borders. This pattern is consistent with broader evidence from arid ecosystems, where species depend on mobility to navigate shifting water and forage availability. The results therefore confirm that the spaces outside national parks are not peripheral or secondary; they are essential for maintaining ecological connectivity across the region. At the same time, the literature review indicates that several emerging land-use pressures could jeopardize this connectivity. Expanding settlements, localized fencing, and increasing livestock densities have begun to alter the structure of certain areas.

While these changes may seem minor on their own, they have the potential if they continue to restrict long-standing wildlife routes. Similar trends observed in other parts of southern Africa suggest that even gradual landscape fragmentation can have major consequences for movement-dependent species. This highlights the importance of proactive planning in Kunene before such pressures escalate.

#### **Interactions Between Wildlife, Livelihoods, and Local Land-Use Decisions**

The social context of the region adds another layer of complexity. Pastoralist communities depend on grazing mobility in much the same way as wildlife depends on ecological flexibility. The overlap of livestock routes, wildlife movement corridors, and shared water sources creates

daily points of interaction. This sometimes leads to conflict, such as livestock predation or competition around scarce resources. The findings echo studies elsewhere in Namibia showing that these costs fall disproportionately on rural households, shaping their willingness to support conservation initiatives. The conservancy system is intended to provide a governance framework that balances these pressures by giving communities rights and benefits linked to wildlife. The findings confirm that this system can support conservation, but they also reveal substantial variation between conservancies. Some have strong leadership, reliable tourism income, and effective management structures; others struggle with limited resources, unclear responsibilities, or inconsistent participation. Differences in governance capacity, rather than ecological conditions alone, appear to be central in determining local conservation outcomes. This reinforces the idea that social institutions formal and informal play a decisive role in shaping the ecological character of multi-use landscapes.

### **Need for Cross-Boundary Conservation Planning**

A critical implication of this research is that biodiversity in Kunene cannot be safeguarded through national park management alone. Because wildlife routinely uses lands managed for livestock, settlements, and mixed livelihoods, conservation planning must extend across administrative boundaries. The literature review found examples of successful collaboration among neighboring conservancies, particularly around shared tourism ventures or wildlife corridors. These cases demonstrate that coordinated management is possible and that local institutions can work together when incentives align. However, such cooperation is not universal, and inconsistencies in communication and planning remain. Strengthening coordination among communities, conservancies, and government agencies is essential for maintaining ecological connectivity.

This includes sharing information about wildlife movements, mapping areas under pressure from land-use change, and developing common strategies for minimizing fragmentation. Without these efforts, the region risks losing some of the ecological fluidity that currently supports wildlife diversity.

### **Balancing Conservation with Community Livelihoods**

Another major insight from this literature review is the tight link between ecological outcomes and livelihood security. In years of severe drought, pastoralist households may increase livestock numbers or expand grazing into new areas, intensifying pressure on vegetation and water points. Such shifts can unintentionally affect wildlife movement or habitat quality. At the same time, when communities receive consistent income or benefits from conservation through tourism, employment, or joint ventures they tend to be more supportive of wildlife management efforts. The results suggest that pastoral mobility, when guided by locally negotiated rules, can coexist with wildlife needs. Historically, rotational grazing and the use of seasonal pastures helped maintain rangeland productivity, which in turn supported biodiversity. Challenges arise when economic stress, demographic shifts, or external shocks disrupt these customary practices. Supporting communities through diversified income options, reliable benefit-sharing, and

drought-adaptive strategies can reduce pressure on the shared landscape and create conditions more conducive to conservation.

### **Contributions and Implications for Future Work**

By bringing ecological and governance perspectives together, this research helps bridge gaps in the current literature on landscape-level conservation in arid regions. The findings show that the spaces between national parks are not merely transition zones, but active ecological and social arenas shaped by both wildlife mobility and human decision-making. They also point to several areas where further research would be valuable. These include finer-scale monitoring of wildlife movements relative to emerging land-use changes, deeper exploration of governance practices within underperforming conservancies, and assessment of how community perceptions shift as environmental and economic conditions fluctuate.

### **Looking ahead, conservation in Kunene would benefit from three complementary strategies:**

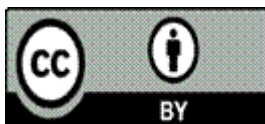
Strengthening local governance and institutional capacity, ensuring that conservancies are equipped to manage wildlife and land-use pressures fairly and effectively. Further, maintaining landscape connectivity by identifying key movement corridors and preventing fragmentation before it becomes entrenched. It has also been observed that enhancing cross-boundary cooperation among conservancies, government agencies, and traditional authorities so that planning reflects the ecological reality of shared landscapes. Overall, the review highlights that long-term biodiversity protection in Namibia depends on recognizing the crucial role of communal and multi-use areas. These landscapes, situated between national parks, form the connective tissue that allows ecological processes and human livelihoods to coexist. Their stewardship is therefore central to the future of conservation in the region.

### **4.0 Conclusions and Recommendations**

This literature review highlights the critical role of communal and multi-use landscapes between national parks in sustaining ecological connectivity, wildlife mobility, habitat use, and resilience in Namibia's Kunene Region. These "in-between spaces" enable wildlife to respond to drought, resource scarcity, and climatic variability while supporting pastoralist livelihoods. Conservation outcomes are strongly influenced by local governance, communal decision-making, conservancy capacity, benefit-sharing, and human–wildlife interactions. The findings demonstrate that ecological and social systems are interconnected and require integrated management. Sustainable conservation therefore depends on strengthening conservancy governance, protecting wildlife corridors, promoting cross-conservancy collaboration, and supporting diversified, drought-resilient livelihoods. Improved human–wildlife conflict mitigation, including compensation and secure livestock enclosures, is also essential. Furthermore, incorporating pastoralist traditional knowledge into planning can enhance conservation relevance and community acceptance. Future research should strengthen long-term monitoring of land-use change, wildlife movements, climate variability, and social–ecological interactions to support adaptive, evidence-based conservation planning.

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