

CONSERVATION AT THE URBAN FRINGE: STAKEHOLDER CONTESTATIONS AND SOCIO-SPATIAL DYNAMICS IN THE CONTEXT OF A NATURE RESERVE

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Abstract: Historically, the relationship between protected areas, conservation and tourism stakeholders, and host communities has been highly contested. This study focused on the Abe Bailey Nature Reserve (ABNR) in South Africa, which has long been plagued by continuous conflicts and disturbances involving the protected area, host communities, and conservation officials. Owing to its unique location within a peri-urban township, its operations and outcomes are characterised by systemic issues of public service failure, poverty, and societal mistrust in government and related projects. This is set against the backdrop of the protected area being leveraged to address socioeconomic challenges through the transition of the land from mining to conservation. In this context, the study explores the interactions between key stakeholders, host communities, conservation authorities, and governing authorities, in order to broaden understanding of protected area and community relations. A

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combination of in-depth interviews and focus group discussions with stakeholders reveals that conservation concerns related to poaching, human population pressures, encroachment, and lingering racial perceptions of the reserve were major sources of conflict among stakeholders. Overall, the study highlights how economic and sociopolitical factors shape conservation effectiveness in peri-urban contexts, suggesting implications for policy rethinking for destination managers.

Key words: protected areas; host communities; conservation; conflict; stakeholders; political ecology

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INTRODUCTION

The African region is globally recognised for its rich biodiversity (Mastrangelo, et al., 2024). These natural resources and spaces have increasingly been leveraged for economic development (Saarinen, 2019; Bollig, 2024). However, they are under growing threat from the progressive and compounding impacts of human population expansion and activity (Bollig, 2024). For instance, Nguyen and Jones (2022) report a 68% decline in mammals, birds, fish, and plant species between the 1970s and 2016. In response to these anthropogenic pressures on the natural environment, conservation and the establishment of protected areas have become central to the global agenda for addressing environmental change and biodiversity loss (Gelves-Gomez, et al., 2024; Bollig, 2024). Nguyen and Jones (2022) further emphasise the significance of effectively managed protected areas in mitigating this crisis. Despite this, several scholars have questioned both the conceptualisation and implementation of conservation, particularly in relation to protected areas. Saarinen (2019) and Barraclough (2025), for example, critique the idealistic, Edenic view of conservation, which has historically separated nature from the people inhabiting these spaces. This ideology was entrenched through the Yellowstone National Park model, which institutionalised the forceful exclusion of host communities in the establishment of protected areas (Dutta & Cavanagh, 2025). Although the late 1990s and early 2000s introduced shifts towards more inclusive and collaborative governance structures, relationships between protected areas, adjacent communities, and conservation authorities remain fractured (Gelves-Gomez, et al., 2024; Di Marzo, & Espinosa, 2025). More recently, scholars have highlighted how protected areas continue to perpetuate colonial legacies through systemic marginalisation, power imbalances, restricted access to resources, and the disproportionate costs borne by African communities in the name of conservation (see Saarinen, 2019; Barraclough, 2025; Dutta, & Cavanagh, 2025; Alexiou, et al., 2024).

The proliferation of protected areas in Africa has resulted in the dominance of nature-based tourism as a means to support both conservation and economic development agendas (Lekgau, & Tichaawa, 2021, 2024; Dutta, & Cavanagh, 2025). This form of tourism has substantial potential to transform the socio-economic realities of communities residing near or adjacent to protected areas. However, due to the context of these destinations, the dynamics between biodiversity conservation and communities remain a significant area of concern for all stakeholders involved (Dutta, & Cavanagh, 2025). Certainly, Matose et al. (2025) acknowledge the volatile nature of the relationship between poverty, environmental degradation, and protected areas in Africa. This arguably has implications for the performance of tourism as well as its ability to filter benefits to the local scale. This contentious relationship is attributed to the competing and often overlapping goals of the new shift in conservation, particularly relating to the use of natural resources (Black, & Cobbinah, 2017; Moswete, & Thapa, 2018; Dutta, & Cavanagh, 2025).

The success of protected area management and tourism, particularly in attaining their goals aligned with conservation and community development, is dependent on the interactions between various stakeholders, power dynamics, and policy implementation (Nyaupane, et al., 2022). This current study seeks to explore the stakeholder relationships in a small protected area, Abe Bailey

Nature Reserve, in Carletonville, South Africa. This reserve presents an interesting case study site, owing to the land and resource use changes that have occurred in the community's recent past. The reserve is situated in an area dominated by mining activities, and the protected area is owned by a mining organisation that has leased the land to the local government for conservation and tourism purposes (Taylor, 2012). The surrounding communities reside in a township and are characterised by high poverty rates, crime, and poor service delivery. As such, the reserve is under pressure to conserve the existing natural resources, support community well-being, and foster economic activities such as tourism. The focus on a small protected area, situated in a peri-urban space, presents a compelling case to examine how context shapes stakeholder dynamics and the subsequent implications for the efficacy of conservation measures. This case study site provides a valuable opportunity to contribute to the broader understanding of the intricate relationships between communities, protected areas, and tourism, and to inform strategies for the sustainable management and development of nature reserves as well as their effective conservation.

LITERATURE REVIEW

Protected areas provide a range of benefits to diverse stakeholders involved (Chiutsi, & Saarinen, 2019; Stone, et al., 2022). As articulated by Stone et al. (2022: 2495–2496), “protected areas no longer simply protect; they also provide ecosystem services and facilitate poverty reduction through local development, ecotourism, and sustainable resource use.” Štrba et al. (2020) contend that societies cannot be dissociated from nature and biodiversity. China presents a significant case study, having successfully established a network of over 2,700 protected areas where communities frequently inhabit or are situated in proximity to these zones (Wang, et al., 2019). Consequently, equitable sharing of responsibilities and benefits arising from protected areas has become essential to conservation initiatives, particularly in regions where communities share boundaries with these areas. Nevertheless, the interactions between protected areas and communities remain intricate due to the historical and socio-ecological relationships between humans and nature (Lekgau, & Tichaawa, 2019, 2020; Štrba, et al., 2020; Stone, & Nyaupane, 2018; Allendorf, 2022). Numerous host communities depend on protected areas for subsistence activities such as hunting and fishing, especially in underdeveloped rural regions with limited income-generating opportunities (Tichaawa, & Lekgau, 2024). Given that protected areas are frequently situated in remote locations, communities have developed heightened expectations regarding the socio-economic benefits they can derive from these areas, particularly with the advent of tourism (Stone, et al., 2022).

However, as Synman and Bricker (2019) observe, communities adjacent to protected areas often experience exceedingly high unemployment rates despite the presence of tourism. In sub-Saharan Africa, researchers such as Mabele et al. (2024) underscore the enduring isolation of protected areas, a remnant of colonial conservation practices that excluded local communities. Sabuhuro et al. (2017) further elucidate that this historical exclusion has led to diminished rights over natural resources, fostering resentment and exacerbating human-wildlife conflicts. Cousins (2018) illustrates these tensions through the case of Addo Elephant National Park, where forced removals obliterated the cultural and historical identities of displaced communities.

This history has prompted scholars to scrutinise whether protected areas can effectively fulfil their Sustainable Development Goals (SDGs), particularly when prioritising conservation over social equity (Chiutsi, & Saarinen, 2017, 2019). Some researchers advocate for the continued or regulated consumptive use of natural resources within protected areas as a more viable strategy for community development (Arnett, & Southwick, 2015; Mbaiwa, 2018). For instance, in Spain's Cap de Creus protected area, fishing remains the primary economic driver, bolstering both employment and local development (Higuero, et al., 2023). Similarly, hunting tourism has been recognised for its socioeconomic contributions in various contexts (Arnett, & Southwick, 2015; Mbaiwa, 2018). Beyond socio-economic challenges, biodiversity conservation is also impacted by anthropogenic land use change, climate change, and invasive species (Saarinen, 2019; Bollig, 2024; Nguyen, & Jones, 2022). This has broadened the conservation agenda to more explicitly incorporate human

dimensions. Stone et al. (2022) assert that protected areas now serve both biodiversity and recreational purposes. Mabele et al. (2023) conceptualise biodiversity conservation as an endeavour to protect ecosystems while acknowledging human-biodiversity relationships. In the African context, many rural communities attribute spiritual and cultural significance to protected areas. Although African traditions are not homogenous, some communities continue to utilise these areas for ceremonies and healing practices (Sapp, 2023). Such practices bolster the argument for community involvement in the governance of protected areas (Sapp, 2023). Mabele et al. (2023) further contend that integrating indigenous knowledge into conservation strategies may enhance long-term success.

THEORETICAL FOUNDATION

The authors situate this study within the framework of political ecology theory, which is pertinent given the intricate networks surrounding the protected area, host communities, and conservation stakeholders. This theoretical perspective offers a valuable lens through which to examine the relationships between society and nature, as shaped and influenced by economic and political structures (Clark, & Nyaupane, 2024; Koskei, & Glyptou, 2025). The relevance of this theory is particularly pronounced in the context of the Abe Bailey Nature Reserve, especially in light of the contemporary issues concerning conflicts, inequality, and power relations that have impacted both the operations of the reserve and the development of the surrounding area. Gurung and BurnSilver (2024) elucidate the complex interconnections between local ecosystems and economic change, emphasising the necessity of considering the social and political context in comprehending such ecosystems. These relationships have undergone significant transformations due to population growth and its subsequent effects on natural environments, culminating in a global agenda aimed at environmental protection, which has included the establishment of protected areas (Saarinen, 2019; Clark, & Nyaupane, 2024; Koskei, & Glyptou, 2025). Such conversions have drastically altered the relationships between humans and these environments. In Africa, the forced removal of communities from protected areas, coupled with subsequent attempts to reconcile these communities with conservation principles, has engendered hostility, non-compliance, and antagonistic relationships (Lekgau, & Tichaawa, 2019; Dutta, & Cavanagh, 2025). In this context, Mathis and Rose (2016) acknowledge the detrimental use of conservation as a means to exert political control over the natural environment and its resources. The introduction of tourism into these dynamics has frequently resulted in unequal distributions of power, access, and development (Tichaawa, & Lekgau, 2024; Saarinen, 2019). Consequently, political ecology theory can underpin these relationships by examining the social, economic, and political actors and forces competing for control, access, and utilisation of the natural environment and its resources (Mathis & Rose, 2016).

Human-nature relationships are dynamic, as nature itself is a socio-politically constructed concept that varies over time and space, contingent upon socio-economic and political transformations (Mosedale, 2016; Saarinen, 2019). Furthermore, socio-economic transformations further enact change in these relationships (Mosedale, 2016). This is particularly salient in the context of the current study, the Abe Bailey Nature Reserve (ABNR), located in Carletonville. The area has experienced significant trigger events that have shaped human-nature relationships, including the 2007 collapse of the Elandsdraal mine, which was a consequence of unstable land conditions resulting from mining operations, as well as economic decline, social unrest, wildfires, and illegal mining activities.

These events have prompted more concerted efforts to conserve the existing natural resources. Additionally, the loss of income due to reduced mining activity and changes in land use within the Abe Bailey reserve necessitates further insights into the existing relationship between the community and the protected area. In this regard, political ecology theory provides a valuable framework to ground this examination and its implications for the attainment of the core mandate of the protected area and the development of tourism.

THE STUDY SETTING: ABE BAILEY NATURE RESERVE

Located approximately 90 km west of Johannesburg and 7 km north-west of Carletonville, the ABNR (see Figure 1) is a protected area formally owned by the Far West Rand Dolomitic Water Association (FWRDWA). There are no registered land claims against its inception, nor are there any formal co-management agreements in place. The total surface area encompasses approximately 4,197 hectares. On 11 May 1988, the administrator of the Transvaal province and the Chairman of the FWRDWA, which functions as an association for mining houses, signed a lease agreement designating the ABNR for conservation and educational purposes. This area has since been leased to the government for a period of 50 years, set to terminate in May 2038. The primary vision of the nature reserve is to establish itself as a leader in the management of natural resources for agricultural purposes, sustainable rural development, and the promotion of sustainable environments in Gauteng.

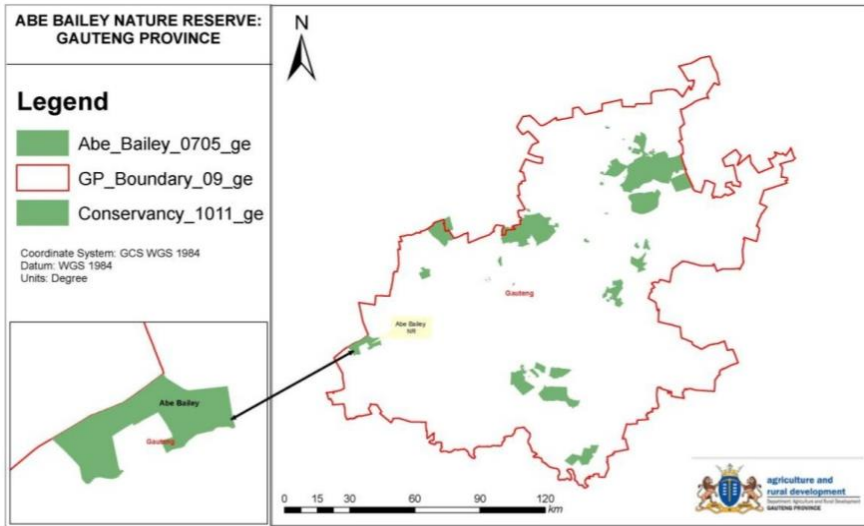


Figure 1. Location of the ABNR

(Source: Department of Agriculture and Rural Development, 2023)

ABNR is a level 2 protected area that contributes 1% to the biodiversity targets in Gauteng and a further 4% towards biodiversity conservation within the national protected area system. Abe Bailey Nature Reserve is rich in a diverse range of flora, consisting of 69 plant families, including the *Hypoxis hemerocallidea*, commonly known as the 'African potato'. In addition, Abe Bailey Nature Reserve is home to various types of fauna, such as the Baboon Spider, Water Monitor Lizards, the African bullfrog, and majestic birds such as the African Marsh Harrier as well as the African Fish Eagle. Furthermore, Abe Bailey Nature Reserve has a variety of mammal species, including the exclusive protection of the White-tailed rat (*Mystromys albicaudatus*), which is listed as a red-list mammal and considered endangered in South Africa. In addition, ABNR protects the African Marsh Harrier (*Circus ranivorus*), which is considered a red-list bird species in South Africa that is threatened by habitat destruction. There are only 10 pairs of this bird species found in Gauteng. The reserve also protects the genetic purity of the Black wildebeest population (approximately 300 individuals) and is one of only two reserves in Gauteng with a wildebeest population. Other mammals protected include porcupines, zebras, Red Hartebeest, Duikers, springbok, the Cape Fox, African small-spotted genets, African clawless otters, black-backed jackals, and Korhaans. Furthermore, the reserve aims to protect the Wonderfontein spruit River segment within its boundaries to preserve endangered fauna habitats. The protected area falls within the Merapong Local Municipality, within the West Rand District Municipality. The protected area is managed and guided by several policies, which include the Gauteng nature conservation policy

that is based on the Nature Conservation Ordinance No. 12 of 1983, which was formed to consolidate and make changes to relevant laws concerning nature conservation (Nature Conservation Ordinance No. 12 of 1983).

METHODOLOGY

The current study followed a multiphase qualitative research process. The data collection phase entailed conducting stakeholder interviews with three key groups instrumental to the development and growth of ABNR. These stakeholders, including tourism and conservation officials, local government officials, and community groups and organisations, were selected for their unique perspectives and experiences in managing the reserve. By engaging with these stakeholders, the researcher aimed to gain a deeper understanding of the complex dynamics at play in the reserve, leveraging their insights to inform a comprehensive understanding of the reserve's activities and relationship with stakeholders. The researchers selected individuals to be part of the interviews based on their involvement in tourism and conservation activities of the nature reserve. Seven interviews were held with the tourism and conservation managers, the representatives of local government, NGO and community leaders both inside and outside the reserve. For the focus groups, the participants comprised community members of the ABNR who were a part of the community-based organisations affiliated with the reserve.

Table 1. Research participants

Data collection type	Stakeholder group	No. of participants
In-depth interviews	Representatives of the reserve	2
	Representative of government authority	1
	Representative of an NGO	1
	Community leaders	3
	Total	7
Focus group discussion	Working with fire	2
	People and park youth representatives	5
	Community nursery group	5
	Total	12

The study involved 12 participants who engaged in focus group discussions. The rationale for employing focus groups as a data collection method was to elicit a diverse array of opinions and perceptions from participants actively involved in various management and conservation activities within the reserve. This approach aimed to obtain a rich and varied dataset, thereby facilitating the researcher's ability to draw multiple insights regarding the reserve. Semi-structured interviews were conducted with three categories of stakeholders: tourism and conservation officials, local government officials (who also serve as conservation and tourism managers), and community groups and organisations. The interview guides were customised for each stakeholder group to gather pertinent information and perspectives. Specifically, separate interview guides were developed for conservation and tourism stakeholders to elicit a range of views and insights into the management and conservation practices within the reserve, as well as the roles and interests in tourism and conservation activities in the area, and the dynamics among stakeholders. The focus group discussion guide was formulated based on a review of the literature concerning community involvement in tourism and conservation in peri-urban areas such as Khutsong. Data collection occurred throughout 2023 and 2024, conducted by the lead researcher. Participants consented to the recording of the focus group discussions and interviews, and the transcripts of these recordings were subsequently uploaded onto Atlas.ti, which facilitated the assignment of individual and later group codes to the data. The group codes constituted the key themes, which are discussed below.

RESULTS

INCEPTION OF THE ABNR

The initial inception and development of the ABNR, particularly in relation to the power dynamics, were found to be instrumental to the current challenges and contention amongst the key stakeholders, impacting effective conservation measures in the reserve. The participants were asked to recall the development of the reserve. Abe Bailey Nature Reserve was established by several organisations, including the Far West Rand Dolomite Water Association (FWRDWA) and the Transvaal Branch of the Wildlife Society of South Africa (TBWESSA), also commonly known as WESSA. Certainly, the participants recognised that the government leased the land for the reserve. However, the participants also mentioned that the inception of the reserve as a formally recognised protected area followed the same system as other protected areas in the country, which involved the forceful removal of communities from the designated protected area, with views such as *‘They were forced removals; you would find that black people were removed to accommodate the whites’* (community representative). One participant mentioned that the initial lease agreement only sought to conserve a small portion of the land, and a few years later, there was an opportunity to increase the amount of land to be conserved. As the goal to increase the land size continued, the issue of zoning off the land became difficult to maintain. This was largely due to the proximity of communities to the zoned-off areas. This is explained by the quote below:

But there’s always been conflict between the community and the nature reserve. Originally, they fenced it off, put in a 5-metre buffer area open, then put a secondary fence. People from the community broke off the original fence line and moved up to the secondary buffer line. So, when I started working here, we already had people from the community staying on reserve property, and they refuse to move; so, until today, those people are there.

Therefore, there currently reside communities in this protected area, on the outskirts of the boundary of the reserve, as well as in the surrounding townships. The community and the importance of their involvement within the nature reserve were only recognised in 2013, following the inception of the People and Parks programme. The People and Parks programme is a strategy for many protected areas in South Africa to reconcile the relationship between protected area conservation and communities by seeking to re-establish a harmonious relationship geared towards ensuring the survival and management of protected areas and supporting the livelihoods of communities. Many participants alluded to the ineffectiveness of this programme owing to societal challenges, such as low education levels, the need to fast-track economic development, as well as the slow economic return from this programme, which lessened community involvement and support. Sentiments such as *‘The programme does nothing’* were shared amongst several community representatives. Further, one went on to add:

When they spoke to us about the project, it was as if they [were] going to bring in the project to the community to minimise the impacts of unemployment in the community, you see? So what’s the use of you giving someone a job on a short-term basis, at least if the project was ongoing. Now they only did it last year and this year they stopped. Now it is June, where are the people? Nowhere.

Moreover, it is important to note that the formalised involvement of the communities was only recognised after 36 years and was found to be one of the reasons for the communities’ discontent with the reserve and its governance structures.

Notably, one of the demarcated areas of the reserve is being leveraged for communal uses, with the Nursery group, a small community-based group that plants in the reserve, being noted as one of the more effective community outreach projects. See quote below:

...then the concept started pertaining to the Green Zone, to have an area available in the reserve where people can have gardens in the reserve, so then we unofficially let people start using land for gardens but I mean we had the road and we asked them not to go beyond that road from location to the road they can utilise that space. Then the department appointed a programme manager to formalise this process. Mr Peters Madire was

appointed; he was the first project manager and he then set up this Green Zone. He called the people of the community together with the nursery we had. We had what they called the Bambanani traditional healers group that was established working with the establishment of the nursery regarding the propagation of medicinal plants because in the early 90s, people just used to walk into the reserve and collect bulbous medicinal plants in bags.

CONSERVATION CHALLENGES

The conservation of natural resources in the Abe Bailey Nature Reserve is facing several concerns, with socio-environmental impacts arising from increasing human populations being an issue alluded to frequently. Interestingly, this issue was specifically stressed by park managers, which was exacerbated by the already close proximity of the community settlements to the reserve, as well as the encroachment of the community into the protected areas. To show evidence of the above-mentioned, a biodiversity officer alluded that:

The location is just getting bigger and bigger and bigger as the years go on. You have more people coming in, which creates a lot of pressure on our resources in the reserve.

The location is right in the middle [of Khutsong]. We are lying 11 kilometres from our boundary against Khutsong – so it does not matter where you are in Khutsong – if you go north, west, or east, as soon as you pass the last house, you are in the reserve.

Khutsong is a growing, underdeveloped township with a nature reserve that has been set aside on mining grounds, with the aim of conserving the environment. However, a sense of urban sprawl, or habitat destruction, occurs as a result of the growing population in the area. This issue is exacerbated by the expansion of the area by the Merafong municipality through the Reconstruction and Development Programme (RDP) houses, which are government-subsidised homes for low-income communities. These houses were expanded in this community to accommodate the growing population in Khutsong. *“The municipality started building RDP houses, people were then moved from this area, so you had less and less people that wanted to be part of the Green Zone anymore”* (representative of the reserve). Unfortunately, this thereby compromises the space that has been reserved for conservation. Indeed, the housing projects would need to expand beyond the reserve’s territory or sometimes within a portion of the reserve’s territory. A member of the protected area management revealed that:

As the years progressed, the municipality started building RDP houses, people were then moved from this area [green zone area set aside by the reserve, for the locals], and you had less and less people who wanted to be part of the Green Zone.

The encroachment into reserve land further exacerbates other conservation concerns, particularly illegal hunting and poaching activities carried out by communities. The ABNR’s strategic objectives include reducing poverty through employment opportunities for the Khutsong community. However, this goal is complicated by the conservation-poverty paradox, which occurs when a nature reserve is established in an area with pre-existing high poverty and unemployment rates.

We [park management] must recognise that unemployment in this area is very high and because you have such a high unemployment rate, people do not value nature because they are looking at their own needs; they want to survive today.

A participant representing the reserve’s governance revealed that during the initial phases of new management, community members would exploit the reserve’s perimeters by releasing wild dogs to hunt food sources within the reserve. In this respect, some participants disclosed that:

We [park management] had a lot of problems with people from the community hunting with dogs and it’s still happening today.

In the early 80s and even 90s, dogs were shot on sight. If you saw a dog in the reserve, it was shot on sight; personnel were equipped with rifles and there are also other ways that people kill dogs, but I won’t mention them.

The killing of the community's dogs in that era, and still today, might have created another problem between the management of the reserve and the community. Another park manager stated that:

The fact that you were killing the dogs of the community members, that in itself created another problem, so now it's becoming like a spiteful thing – you kill my dog, and I'll put a matchstick in your veld.

The practice of hunting within the reserve persists, as community members have recognised the availability of food sources within the reserve and opt to hunt animals for financial gain through illegal black-market sales. Additionally, some residents prioritise stealing animals as a means of providing food for their families, highlighting the complex dynamics of human-wildlife conflict and the exploitation of reserve resources. A community representative revealed that:

For many years we had people hunting with dogs, but now it's like it is becoming more prevalent as people in the community start realising that there is a food source." [Imitating what a community member would say] "We don't have money; we cannot afford meat, but there is a meat source next door.

The reserve faces significant pressure from poaching activities, which are exacerbated by the limited presence and control of reserve management, who are only stationed in specific areas of the reserve. This lack of comprehensive oversight enables community members to engage in unchecked illegal activities, particularly animal theft, throughout the reserve, except at the entrance, where security is present. The absence of robust security measures throughout the reserve creates an environment conducive to poaching and wildlife exploitation. A representative of the community-based organisations revealed that:

Now you have people coming in putting snares, you have people coming in hunting with dogs, there are even people driving along the roads and whenever they see animals, they will shoot and take it out – so there is a lot more pressure on the reserve to protect these resources.

At this time at the moment, we do not have the necessary human capacity to protect these resources [animals] effectively.

The reserve's management has observed a concerning trend in the population dynamics of the game species within the ABNR. Despite conducting annual game counts, the data reveal a stagnant population growth rate over the past few years, which deviates from the expected pattern of increase after a couple of years. This anomaly suggests that the reserve's ecosystem may be facing underlying challenges that are impacting the reproduction and survival rates of the game species. A representative of the community-based organisations highlighted that:

Currently, it [the stagnation of their game population] is not impacting the population negatively, but it does not show any growth and if you continue like this, you are going to eventually have fewer animals available.

Upon discovering that animals have been stolen, reserve management often faces a delayed response, as the discovery typically occurs in the morning, allowing culprits to escape undetected. Moreover, the perpetrators are presumed to be community members, although evidence supporting this assumption is scarce. Following the theft, reserve staff must dedicate resources to repairing damaged fences, diverting attention from conservation efforts.

CONTENTIONS OVER ENVIRONMENTAL IMPACTS

The management of the ABNR has identified numerous challenges encountered during its operational tenure. A long-serving biodiversity officer, with nearly three decades of experience at the reserve, has provided valuable insights as a key informant to this study. According to this officer, the local community has periodically posed a significant threat to the reserve's integrity. The most pressing challenge faced by the reserve is the deliberate tampering with the water system that traverses the protected area, which has been compromised by certain community members. This egregious act has had far-reaching consequences for the reserve's ecological health and biodiversity conservation efforts. However, one park manager opined that:

We [park management] have an issue with water because foreign nationals punctured the main water supply that supplies water to the reserve.

A key informant's statement contradicts previous assertions, revealing that illegal mining activities conducted by foreign nationals within the community have compromised the water system, thereby depriving the reserve of a functional water supply. This has significantly hindered various activities within the reserve, which boasts an array of facilities, including a 60-person hall, four two-bedroom chalets, four lodges with eight bunk beds each, and administrative infrastructure comprising eight staff houses, main offices, a nursery complex, and propagation units. Notably, the reserve's 2012/13 integrated management plan outlined expansion plans for tourism infrastructure, including family chalets, teacher chalets, and a picnic area. However, the water crisis, exacerbated by the community of Khutsong, has severely impacted these facilities. This raises questions about the responsibility of the funding department and the Merafong municipality in addressing the water scarcity issue, particularly since the municipality is tasked with providing essential services, including water, electricity, and refuse collection. The reserve's management plan highlights the municipality's responsibility, yet the community is often held accountable for the water shortage, rather than seeking redress from the municipality. A community leader highlighted that "the river that runs through here is heavily polluted, which is part of the municipality, and the mines play a big role in that". The river system traversing the reserve is characterised by elevated levels of pollution, which significantly influences the development and adaptation of species within the area. According to the reserve management, the following issues have been identified:

The fact that you have your top carnivores operating within this river system should indicate as well that, although it is [the river] polluted, the pollution is not that bad because they can still survive from this.

The reserve management has expressed uncertainty regarding the effects of the severely polluted river system on the local fish species, bird species, and game animals that rely on this watercourse. Furthermore, in addition to the pollution issue, which may not be a primary concern for the Merafong municipality, the reserve has also reported instances of environmental degradation resulting from excessive littering by community members residing within the reserve. A community representative of the study divulged that "when I started working here in 1992, we had heaps and heaps of rubbish lying next to the shacks where the reserve area is." Other participants highlight that while the community bears some responsibility for mitigating littering, it is unfair to place sole responsibility on them. Moreover, the community faces service delivery issues with the Merafong municipality, such as refused services, which creates a ripple effect, pressuring the reserve to address issues that the municipality should prioritise. Certainly, one participant highlighted:

"Currently, if you just go in Khutsong, if you just go drive around and just look at waste management – waste management is still today a big problem in the location. Rubbish lying all over but that is why the people of the community must actually stand up and go to the necessary local authorities saying – hey, you guys are letting us down; you let us live in filthy conditions but it also has two sides to the coin, I mean, what do you do with your rubbish if you don't have a place to dump? Where do you go? The nearest open space.

CONSERVATION VALUES AND ENVIRONMENTAL EDUCATION

Another major contention emanating from the findings relates to the conservation values of the surrounding communities and the related efficacy of environmental education efforts from the ABNR. Unfortunately, many of the participants in both interviews and focus groups were of the opinion that the community didn't hold or display pro-environmental values and behaviours, particularly in relation to the reserve and the importance of its core mandate. In this matter, some participants underscored:

My personal opinion on this fact is that members of the community, specifically within this Khutsong location, don't value the reserve as it should be. I mean, we are trying to protect a grassland habitat that's under immense transformation within Gauteng, especially

regarding development and people will only realise what they've lost after they have lost it.

Many participants suggested that this concern is a cause of the lack of economic value placed on these resources: 'so we have an issue of not getting people who want to participate in the reserve for the benefit of the community, but individual gains. We struggle a lot with this' (community representative) or 'Besides the employment, there is no importance attached to ABNR' (community representative). Other provisions for these issues related to the nature and extent of environmental education for the communities, which received mixed responses in the interviews and focus groups. On one hand, many participants recognise the efforts of the reserve in their environmental education programmes, largely targeted at surrounding schools, which allowed school children in the protected area to learn about the diverse resources therein and the importance of conserving such resources and the manner of doing so. Such initiatives were recognised and appreciated by the stakeholders involved in the study. Notably, some participants were unsure of the continuity of these programmes, particularly after the pandemic.

It was seen as a source of environmental education for communities around Merafong and other areas, as well as for the protection of one grass species, which is very rare. The grass found here has adapted really well to the conditions of the area and the protection of animals such as the wildebeest.

Schoolkids used to come for tours in Abe Bailey. They used to show them the caves.

In terms of environmental education for the broader community, some community representatives were of the view that this has been severely lacking and that the community was made aware of the ABNR, their mandate, activities, and operations, with some participants in the focus groups further adding that this information is often limited to a subjective few members of the community. For instance, see some responses derived from the focus group discussions:

If there was a certain level of importance to the reserve, they (park managers) would make appointments with the people from the township to explain about this area. You could find that there are many people in the township who do not even know about Abe Bailey.

The thing about Abe Bailey is that they are choosy towards the community; the people who are the nearest to Abe Bailey are the ones who will benefit. When you enter the township, most of the people do not know what the purpose of Abe Bailey is. From my side, I grew up in Khutsong, and I only knew what Abe Bailey is about and which animals are here when I started working here.

Other members in the focus groups argued that the onus should also be on the community itself, stating that there is some information sharing and the contributions of the community groups are evident, but the community must be willing to recognise the importance of conservation values and the ABNR regardless of its economic importance. A response exemplifying this includes:

We are ignorant of the fact that there is an Abe Bailey and what is happening inside; we do not want to be involved, so I put the blame on us.

DISCUSSION

This study sought to explore nature conservation through the examination of the relationship between protected areas and the surrounding communities. The four key themes elucidating the protected area-community relationship are interrelated and reflect how historical legacies, economic conditions, and social realities can affect current conservation practices and challenges. Population pressures impacting conservation activities are nuanced, rendering this issue complex and multifaceted. The increase in human populations exerts detrimental impacts on the environment, such as the destruction of natural habitats, overexploitation of natural resources, and loss of biodiversity (Basu, & Savarimuthu, 2015). According to Ceballos and Ehrlich (2023) and Verma et al. (2020), the expansion of urban areas, which results from population growth, has heightened the demand for natural resources, often disrupting wildlife patterns and fragile ecosystems. Furthermore, the expansion of the human population in urban areas has led to an increased need for appropriate

housing, which in this case has been supported by the RPD programme. However, this expansion of residential areas straddles the borders of the reserve, complicating the long-term challenges of expanding, maintaining, and protecting its boundaries. This situation bears further consequences, particularly in light of global initiatives such as the Global Biodiversity Framework's 30 × 30 Target and the Aichi Biodiversity Target 11, which advocate for the expansion of protected areas (Di Marzo, & Espinosa, 2025).

Beyond housing, the growing urban population raises questions regarding the availability and diversity of livelihood options. South Africa exhibits one of the highest levels of unemployment, with Mbokazi and Maharaj (2025) noting that the number of individuals employed in the formal sector is alarmingly low. The lack of economic activities has been identified as one of the factors driving illegal hunting and poaching within the reserve. Such developments may have serious implications for the reserve's environmental priorities and broader social impacts (Kamil et al., 2020). This situation illustrates a human-nature value gap, in which residents near the reserve hold values that diverge from those of the reserve's management. Kubo et al. (2019) explain that a value mismatch can occur when various stakeholder groups, including the community, reserve management, municipality, and policymakers, ascribe different values, beliefs, and attitudes to the environment. This issue presents a significant challenge within the study site, affecting the relationship among stakeholders as well as the effectiveness of reserve management activities. While this conflict is not unprecedented in conservation contexts, the peri-urban nature and structure arguably exacerbate these issues due to overlapping land-use demands, high population pressures, and competing development priorities that intensify tensions between conservation objectives and community needs.

An additional layer of complexity arises in the form of conservation-development conflict, which occurs when the reserve's management fails to address the local community's needs and priorities. This results in a value mismatch between residents and the reserve (Kimengsi et al., 2023). In the case of the Abe Bailey Nature Reserve (ABNR) and the Khutsong community, this paradox is evident. While the ABNR contributes to local economic development through job creation, its impact is constrained by the tension between conservation and tourism objectives and the community's expectations. When communities perceive the reserve as not significantly contributing to their well-being, resentment and conflict may arise, creating additional challenges for preserving critical habitats such as the Carletonville Dolomite Grassland. This issue is further compounded by the local government's inability to address societal needs, resulting in increased anti-environmental behaviours. This challenge was observed when the administrative department overseeing the reserve lacked support from complementary government bodies, such as the Merafong Local Municipality. The absence of coordination can lead to tangible consequences, such as the municipality's neglect of refuse collection in surrounding areas, which has resulted in parts of the reserve being used as an unauthorised dumping ground. This undermines the reserve's ability to promote more environmentally sustainable values.

CONCLUSION

Overall, this study illustrates the complex relationship between the ABNR and the surrounding communities and its implications for conservation practices. The concerns related to population growth, land-use pressures, limited livelihood opportunities, and stakeholder value mismatches underscore that conservation cannot be understood in isolation from broader political and economic processes. By foregrounding these dynamics, political ecology provides a critical lens for examining how power relations, governance failures, and uneven development influence conservation outcomes. These factors also highlight the difficulties faced by the reserve in expanding its tourism operations, as its facilities and efforts are hindered by these challenges. The challenges encountered at the reserve are not merely ecological but are deeply embedded in broader structures of inequality, marginalisation, and competing claims to land and resources. As protected areas continue to develop and expand in both rural and urban contexts, this study demonstrates the

necessity for designing inclusive, context-sensitive strategies that balance conservation goals with community needs. Furthermore, while not emerging as a major finding, the role of community structure and social capital is arguably influential in disseminating critical information concerning the reserve and how to sustainably utilise and leverage natural resources for societal needs.

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