

Opportunities and constraints for community-based conservation: The case of the KwaZulu-Natal Sandstone Sourveld grassland, South Africa

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Background: South Africa is characterised by high levels of biodiversity and species endemism alongside critical levels of socio-economic vulnerability, demonstrating potential for conservation practices that provide both environmental and social benefits. It is argued that community-based conservation (CBC) practices can be strategically positioned to achieve environmental conservation objectives as well as promote local-level socio-economic development. The KwaZulu-Natal Sandstone Sourveld (KZNSS) vegetation type is classified as endemic (to KZN, South Africa), and is at present listed as endangered. Additionally, one of the KZNSS grassland patches occurs adjacent to the low-income peri-urban community of iNanda. The study examined local community uses and perceptions of the vegetation type.

Objectives: To examine the uses, perceptions and attitudes displayed by the iNanda community towards the KZNSS grassland patch. Furthermore, it is hoped that the results of this study can be utilised to inform the potential use of CBC strategies within socio-economic contexts such as iNanda.

Method: A mixed methodological approach was adopted, focusing on iNanda as the case study. One hundred households were purposively interviewed. Descriptive and chi-square statistical tests were carried out to examine main data trends.

Results: Respondents displayed alarming levels of unemployment (61%) and 34% relied on state grants as a source of household income. Households used the grassland for subsistence (51%), grazing (14%), recreational (13%) and cultural purposes (12%). Respondents displayed limited awareness of conservation and the ecological importance of the grassland. However, respondents recognised the need to conserve the grassland based on their perception of changes to the adjacent patch.

Conclusion: Potential grassland conservation plans should consider the current use displayed by respondents. Participatory approaches to conservation such as CBC initiatives could provide much-needed socio-economic and conservation benefits.

Introduction

Current concerns over climate-related impacts, coupled with the immediate socio-economic development challenges within developing countries, warrant the need for multi-disciplinary approaches to conservation. In this regard, community-based conservation (CBC) initiatives are widely promoted to achieve both environmental and socio-economic developmental goals. South Africa is characterised by high levels of biodiversity and species endemism alongside critical levels of socio-economic vulnerability and poverty, which presents significant potential for CBC practices that aim to provide both environmental and social benefits. The present study examines the use, perceptions and attitudes towards the KwaZulu-Natal Sandstone Sourveld (KZNSS) vegetation type, and more specifically a grassland patch located adjacent to iNanda, a peri-urban community. The KZNSS grassland is listed as endangered and endemic to KZN Province. Additionally, iNanda displays high levels of unemployment, suggesting socio-economic vulnerability and poverty (Statistics South Africa (SSA) 2011).

Furthermore, it is hoped that the present study will inform the potential of CBC-based approaches to conserve this threatened vegetation type and provide some much-needed socio-economic benefits to the local community. Green spaces within urban matrices have become increasingly difficult to conserve in their natural state, using conventional fortress-based practices (Department of Environmental Affairs 2011). This is attributed to the wide range of ecological and socio-economic purposes they serve to surrounding communities (Munien *et al.* 2015). For example,

grasslands within the eThekweni municipal area (EMA) house a range of endemic species (Mucina & Rutherford 2006), but also serve as grazing land for livestock, a source of medicinal plants, and natural material for crafting and building (Munien *et al.* 2015). In light of this, conservation practices applied to these sites need to accommodate both socio-economic and ecological needs. The value of CBC-based initiatives in these contexts is indisputable in potentially providing benefits across sectors.

CBC practices have become increasingly popular within developing countries, having the potential to provide multiple social, economic and ecological benefits (Berkes 2004, 2007; Campbell & Vainio-Mattila 2003; Metha & Heinen 2001). According to Baird and Leslie (2013), CBC is defined as a people-centred participatory approach to conservation that can provide diverse environmental and socio-economic benefits. Historic conservation practices within South Africa were dominated by racially-based approaches that restricted access and dispossessed people of rights to land resources (Cock & Fig 2000). These approaches are described as autocratic and non-participatory (Cock & Fig 2000). According to Berkes (2007), these approaches resulted in conflict because of their inherent failure to recognise the consumptive- and value-based uses of ecological goods and services.

Since the 1980s, there has been a notable shift in conservation policy where the fortress conservation model was gradually transformed to more people-centred approaches (Benjaminsen & Svarstad 2010; Büscher 2016; Kalamandeen & Gillson 2007). Similarly, Egoh *et al.* (2012) state that conservation sciences have undergone radical shifts resulting in contemporary approaches, such as CBC, that attempt to address context-specific conditions and provide numerous benefits to local communities. For example, CBC programmes have been used in South Africa in an attempt to redress past inequalities and empower previously disadvantaged groups (Büscher 2016; Cock & Fig 2000).

The present study examines the uses, perceptions and attitudes displayed by the iNanda community towards the adjacent KZNSS grassland patch. It is hoped that the study's results will inform the potential use of CBC programmes that will provide conservation and socio-economic benefits through enhanced community participation. The following sections provide a description of the theoretical underpinnings informing the study, followed by an overview of the research methodology, a discussion of key findings, and concluding remarks and recommendations.

Community-based conservation: A transdisciplinary approach

CBC approaches have three main theoretical underpinnings: (1) the change from reductionist perspectives to a systems viewpoint which argues that components within the environmental system may have nonlinear effects (Berkes 2004); (2) the socio-ecological framework identifies humans as key agents within natural systems; and (3) the change from expert-orientated approaches to people-centred approaches

(Berkes 2004). The new paradigm of local participation was arguably based on two main premises, that local communities need to be involved in the management of protected areas, and that these communities must derive benefits from the intended conservation initiative (Benjaminsen & Svarstad 2010).

Mehta and Heinen (2001) assert that the change to bottom-up approaches is linked to multiple benefits such as income generation for local communities through improved tourism, and enhanced protection and conservation of ecological resources. The incorporation of local community interests into environmental protection planning has resulted in initiatives that seek to promote local participation, benefit sharing, and compensation to those groups whose livelihoods may be dependent on the ecological resources being conserved (Benjaminsen & Svarstad 2010). The establishment of conservation areas through fortress-type approaches has been criticised for the lack of emphasis and recognition of the socio-economic links to neighbouring communities (Karki 2013). The lack of understanding of the socio-economic context further constrains the ability to effectively monitor the impact of CBC projects on local livelihoods (Karki 2013). As part of designing effective participatory conservation initiatives, planning ought to represent, as part of its objectives, the local socio-economic landscapes, community interests and values (Khadka & Nepal 2010).

Typical environmental protection policy has been characterised by bureaucratic management approaches, where various levels of government and/or conservation organisations often regulate and act as the implementation agents (Abrams *et al.* 2009; Cock & Fig 2000). Sustainable reforms of environmental protection have seen the devolution and decentralisation of management in the form of community-based initiatives, participation and shared responsibility with local communities (Berkes 2010). The shift to embrace community participation in conservation efforts has resulted in transformation to governance-based structures that have concomitantly led to the establishment of community partnerships (Martin & Rutagarama 2012). As a result, there is significant potential and opportunity to promote infrastructural and financial development opportunities to areas traditionally lacking development (Baird & Leslie 2013).

It is argued that these programmes dedicated to simultaneously achieve socio-economic development and environmental protection ought to incorporate local community culture as a means of promoting capacity (Abrams *et al.* 2009). A crucial aspect of CBC planning is determining and understanding the manner in which the resource base is linked to local communities through their derived values (Abrams *et al.* 2009). Ecosystem functioning is central to both short- and long-term community well-being. Short-term benefits are linked to the direct uses of ecosystem goods for purposes such as food security, whilst long-term benefits include regulatory ecosystem functions such as climate control (Bille, Lapeyre & Pirard 2012). Disruption to these socio-ecological linkages, and specifically denied access to ecosystem goods

and services, can have detrimental impacts on communities (Baird & Leslie 2013).

The continued emphasis on local community participation and promotion of social development through conservation has been echoed by international organisations such as the International Union for Conservation of Nature (IUCN) and the World Wildlife Fund (WWF) (Benjaminsen & Svarstad 2013). Initiatives such as the United Nations Educational, Scientific & Cultural Organisation (UNESCO), the Integrated Conservation and Development Projects (ICDP), and the Man & Biosphere Programs (MABPS) further emphasise the need to link social development with environmental protection (Khadka & Nepal 2010).

The Community-based Natural Resources Management (CBNRM) initiatives have become synonymous with ideals such as sustainable development and democratic decision-making processes concerning community participation, thus increasing the likelihood of acceptance and legitimacy of protected area management (Stoll-Kleeman, de la Vega-Leinert & Schultz 2010). Such participation results in the exchange of knowledge between local communities and conservation agencies, promoting co-operative and accountable conservation practices (Stoll-Kleeman *et al.* 2010). Dahlberg and Burlando (2009) assert that incorporating social well-being into environmental protection planning within South Africa encounters several challenges. For example, high levels of biodiversity and species endemism require localised and context-specific conservation approaches; this is exacerbated by inequitable access to ecological goods and services, and large-scale poverty (Dahlberg & Burlando 2009).

With the growing popularity of CBC initiatives and the realisation that protected spaces cannot be examined in isolation of the human context, there is a need to incorporate diverse perspectives to manage such systems (Gruber 2010; Metha & Heinen 2001). These diverse perspectives are provided through the transdisciplinary practice of engaging with experts across various disciplines as well as the public (Gruber 2010). The rise of transdisciplinary approaches to conservation and environmental protection has been influenced by the growing awareness of the complex socio-ecological links and dependencies (Berkes 2010). A transdisciplinary approach further allows the mediation of associated trade-offs that arise in achieving environmental and social goals (Berkes 2010).

It is within this transdisciplinary context that eThekweni Municipality has established a partnership with the University of KwaZulu-Natal, drawing from a wide range of disciplines in an attempt to encourage research focused on the conservation of sites of ecological importance, such as the KZNSS grassland. The present study sought to further the understanding of the uses, perceptions and attitudes towards the KZNSS grassland patch located within the iNanda community. In doing so, it is hoped that the findings contribute to successful management and understanding of the KZNSS grassland.

Methodology

Study setting

The study focuses specifically on the use, perceptions and attitudes towards the KZNSS grassland patch located within iNanda, in an attempt to inform the potential for CBC-based approaches to conserving this threatened grassland. iNanda is a peri-urban community located within the EMA. The total population of iNanda is 10032 within 2623 households, and an average household size of 3.8 (SSA 2011). Census data show that the community is characterised as having high levels of dependency (54.3%) with 47.7% of households being female-headed (SSA 2011). The historical background of the community is entrenched with inequalities and socio-economic challenges, similar to those of numerous townships during the apartheid era (Marschall 2012). Early occupation occurred in the 1800s and has undergone significant changes, particularly in relation to the Group Areas Act of 1950 (Department of Provincial and Local Government, 2007).

Since the inception of democracy and a focus on empowering previously disadvantaged areas in South Africa, the community has benefited in infrastructural development (Marschall 2012). However, the community is still experiencing high levels of unemployment, poverty, crime and health challenges (Marschall 2012; Munien *et al.* 2015). According to census data, 40% of residents were unemployed, with 25% of households having no access to electricity, and consisting mainly of informal housing settlements (SSA 2011). The iNanda community is also currently involved in a coastal scarp forest restoration project, which forms part of eThekweni Municipality's Community Reforestation Programme. The Wildlands Conservation Trust (WCT) was appointed to implement the project through its Indigenous Trees for Life (ITFL) programme which is aimed at assisting unemployed people, subsequently known as Treepreneurs, to set up small-scale indigenous tree nurseries at their homes (Douwes *et al.*, 2015). The KZNSS is classified as an endangered vegetation type that comprises short grass species, low shrubs and endangered species such as Proteaceae trees and shrubs (*Protea*, *Leucospermum*, *Faurea*) (Mucina & Rutherford 2006). Remnant patches are distributed along the coastal and inland plateaus of KZN Province, with the parent population primarily located within the Maputaland-Pondoland-Albany belt (Mucina & Rutherford 2006). Currently, 73% of the KZNSS grassland has been transformed for sugar cane cultivation and urban development projects, warranting immediate conservation action (eThekweni Municipality 2013).

Design, data collection and analysis

A mixed methodological approach was used in the present study, with iNanda being the case study. A structured questionnaire was used as the primary data collection tool and was administered to 100 households, based on proximity to the grassland patch. A multi-stage sampling approach was used; firstly, households within a 2-km radius of the grassland patch were identified. The second stage involved the selection

of individual households using a random table of household numbers (lot numbers). During the data collection, if these households were not available or unwilling to participate, the nearest neighbouring household was then sampled. Surveys were administered in June 2014. The questionnaires consisted of open and closed-ended questions which were communicated to respondents in their preferred language of isiZulu or English. Primary data obtained were captured and analysed using the Statistical Package for Social Sciences (SPSS), Version 22. It must be noted that the study was part of a larger ongoing collaboration, and data presented in the present article pertain specifically to the KZNSS grassland patch.

Results and discussion

Understanding and incorporating the social backdrop in which CBC initiatives are implemented allows a more robust analysis of project outcomes. As such, data reveal that the iNanda community can be classified as having high levels of unemployment (61%). These results are disconcerting, given that the majority (81%) of respondents were between 18 and 59 years old (economically active age category). Additionally, the heavy reliance on state grants (social aid) (34%) as a source of household income further highlights the economic instability and vulnerability experienced by respondents; this also suggest high dependency amongst respondents. These findings align with census data that show a 54.3% dependency within the iNanda community. In this regard, CBC initiatives have the potential to significantly enhance local development and socio-economic benefits through job creation. Incorporating the immediate needs of the local communities as part of project outcomes may also improve community participation through acceptance and the appeal of improved income generating potential.

Utilisation and perceptions of the KZNSS grassland patch

In understanding the links between community livelihoods and their surrounding ecological systems, it was deemed necessary to establish whether community members were aware of the KZNSS grassland. Results revealed that a vast majority of respondents (71%) were not aware of the terms KZNSS. However, the remaining 29% described it to be a grassland, suggesting that some respondents were able to associate the spaces with a specific vegetation type. Even though results indicated limited levels of awareness, a noteworthy proportion of respondents (51%) utilised the KZNSS grassland for a variety of purposes (Figure 1). Forty-nine per cent of respondents indicated that they did not use the grassland patch.

Respondents listed gathering of resources (44%), crafting of baskets and brooms (15%) and agricultural practices, such as crop production (13%), and grazing for livestock (14%) to be the main uses. Within the southern African context, livestock are vital livelihood assets as they are considered to be potential financial assets, and a source of food and nutrition (Egoh *et al.* 2012). Although engagement

in agricultural and pastoral activities was not a widespread practice amongst respondents, a noteworthy proportion of respondents were arguably at risk of livelihood disruption as a result of degradation to the KZNSS grassland patch. Additionally, it is argued that income-deriving environmental goods serve as safety nets and contribute to household livelihoods during periods of financial uncertainty, thus making them crucial in low-income communities, such as iNanda (Angelsen *et al.* 2014).

In addition, 11% of respondents stated religious and cultural purposes to the ecosystem. The religious and cultural attachment to natural environments is a common practice in many African communities (Egoh *et al.* 2012). It is stated that nature and green spaces contribute to spiritual and mental well-being and are an important aspect in the cultural identity of local communities (Egoh *et al.* 2012). Studies by Ngara and Mangizvo (2013) found that in Nigeria, Ghana and Zimbabwe, religious and cultural beliefs often complemented conservation objectives because these justified the restriction and sustainable use of particular resources. As such, in communities where religious and cultural beliefs are not assigned to resources, conservation authorities may face challenges in motivating the conservation of species beyond the rationale of ecological protection. Smaller proportions of respondents noted that the KZNSS was utilised for activities such as roof thatching (9%) and recreation and leisure (3%), which again highlights specific livelihood needs in the manner in which the grassland patch was utilised by the local community.

Unpacking specific uses of these spaces can provide useful information for conservation decision-makers, particularly for projects characterised by the exchange of information, and those aiming to examine willingness to forgo the use of ecosystem goods and services for conservation needs (Bryan *et al.* 2011). Moreover, these results highlight utilisation based mainly on extractive and direct-use values, with low levels of cultural services derived from the grassland patch. Despite the fact that the community derived low levels of cultural services from the KZNSS (11%), the study shows that the ecosystem provides both tangible and intangible benefits.

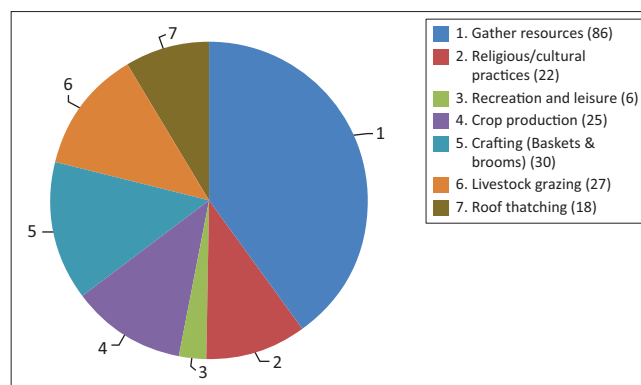


FIGURE 1: Main uses of the KZNSS grassland patch ($n = 100$, in %) (multiple responses permitted).

According to Bryan *et al.* (2011), natural landscapes function as complex socio-ecological systems, and therefore CBC and other conservation strategies are required to account for not only the ecological components of an ecosystem but also the social values. It can be argued that the KZNSS is an integral component of local livelihoods, and therefore socio-ecological links need to be adequately reflected in conservation and environmental protection plans. This situation can be viewed as an opportunity for the extension of participatory conservation practices such as CBC which can offer multiple benefits and may enhance conservation without compromising local livelihoods. However, because this ecosystem services multiple needs of the iNanda community, potential CBC initiatives must be based on equitable access to, and distribution of, opportunities and benefits. Campbell and Vainio-Mattila (2003) warn that equity, continuous consultation and transparency in CBC initiatives are fundamental to developing and maintaining partnerships with local community members.

A major critique of CBC initiatives is the lack of integration of indigenous knowledge systems and practices and, community consultation during the various stages of the project lifecycle (Munien *et al.* 2015). Therefore, this study examined local levels of awareness and perceptions towards the KZNSS grassland in an attempt to identify aspects that may promote local community participation. The researchers also considered environmental knowledge as a possible opportunity for the establishment of strategic collaborations between the local community and government and/or conservation bodies. In this regard, respondents were probed on specific changes they perceived in the KZNSS grassland patch over the last 10 years (Figure 2).

The majority of respondents (71%) did not notice any changes to the grassland patch over the preceding 10 years. Surprisingly, only 29% of respondents stated that they had noticed changes, even though a larger proportion (51%) actively utilised the grassland. Amongst these respondents, a small proportion (9%) noted a decrease in biodiversity and

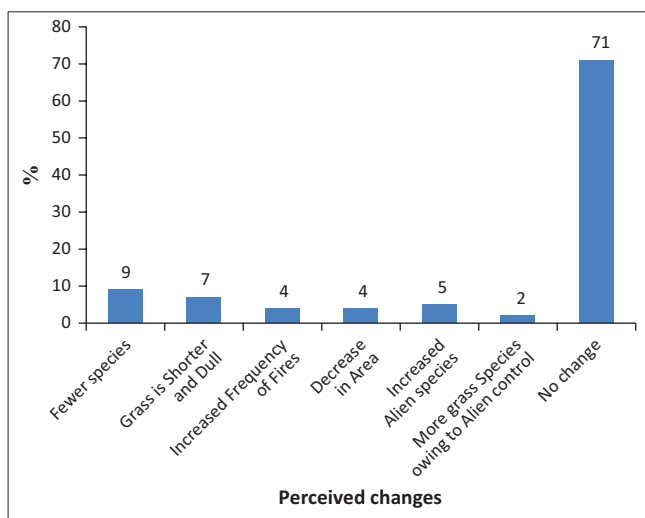


FIGURE 2: Respondents' perceived changes to the KZNSS grassland patch over the last 10 years ($n = 100$, in %).

the area occupied by the grassland patch (4%). Seven per cent of respondents perceived the grass species to decrease in height and display a less vibrant colour over the preceding 10 years, with 4% noting a high presence of alien invasive species and an increase in the occurrence of fires (4%). These results suggest a deterioration of the overall health of the ecosystem which aligns with the argument that the KZNSS is a threatened vegetation type in need of conservation and protection. Lastly, 2% of respondents noticed an increase in the number of grass species inhabiting the site which they attributed to increased alien removal programmes.

Understanding the changes to a particular ecosystem is crucial for conservation planning as it establishes a state of reference whereby certain patterns of resource consumption may be identified as threats to the well-being of that vegetation type (Stump 2010). Such understanding assists in determining the ability of an ecosystem to sustainably support both ecological and social communities (Stump 2010). Even though a minority of respondents were perceptive of changes in the KZNSS, it is worth noting that some of the changes highlighted by respondents align with key findings by Rouget *et al.* (2014). The results suggest that some respondents displayed detailed knowledge of the status of the grassland patch, which can be viewed as a possible opportunity for future conservation plans for the KZNSS. Furthermore, including indigenous knowledge systems is believed to enhance conservation efforts, especially when sites of ecological value are located in spaces of mixed land use practices – for example, residential and ecological value (Aswani & Hamilton 2004; Tengö *et al.* 2014; Turnhout *et al.* 2013).

This belief is indicative of the potential in incorporating local knowledge into CBC practices as a means to strengthen public involvement. Additionally, establishing partnerships with local communities that access ecologically sensitive areas such as the KZNSS can improve the availability of continuous environmental monitoring data, whereby members of the community are trained to capture and record aspects that reflect local ecological well-being. In doing so, conservation organisations and/or local government can enhance local capacities through the transfer of skills. More importantly, this approach can lead to the establishment of continuous ecosystem databases that can promote more efficient and context-specific conservation practices.

In further unpacking respondents' perceptions regarding the KZNSS, 27% of respondents expressed dissatisfaction with the quality of the grassland. A collective 12% of respondents were satisfied (1% very satisfied; 11% satisfied). The health of an ecosystem is not only important for the ecological functioning that supports species within an area, but also for the social well-being of individuals dependent on the ecosystem (Sandifer, Sutton-Grier & Ward 2015). There is a growing body of literature which suggests that biodiversity influences human health (Sandifer *et al.* 2015). It has been stated that increased ecosystem deterioration can have

negative physiological and psychological consequences (Sandifer *et al.* 2015). However, drawing a decisive conclusion on the actual levels of satisfaction within the sampled population would require caution, as a noticeable proportion of respondents (61%) felt neither satisfied nor dissatisfied with the status of the ecosystem.

Conservation practices

The present study probed issues specific to awareness and the practice of conservation. Respondents were also asked whether they believed that there was a need to conserve the grassland. The majority of respondents (80%) indicated awareness of the term 'conservation' and provided their perceptions (Table 1). Based on respondents' perceptions of conservation, it is evident that there was an overall understanding that the term referred to the practice of protection (45%) and maintenance (26%) of natural environments. A smaller proportion stated 'restoration of damaged environments' (3%). Even though none of the respondents provided an exact scientific definition, the manner in which the term was conceptualised suggests high levels of awareness and knowledge of the rationale for conservation.

Vodouhe *et al.* (2010) assert that there is a need to understand perceptions regarding conservation practices, as these perceptions can contribute to, or often restrict, community engagement in natural resource management. Given the above results, conceptualisation of conservation looks promising and can be viewed as a potential opportunity for legitimacy of CBC initiatives. Only a small fraction of respondents (6%) were unable to provide a description. Respondents were further asked to indicate whether there were isiZulu and/or isiXhosa words which relate to conservation. Respondents reported the words *uKugcina* (49%), *uKuvikela* (36%), *uKuphephisa* (10%) and *uKunakekela* (6%). Collectively, these words translated into English denote the sense to maintain, protect, prevent harm to, and care for the environment. This finding reveals a positive association between the scientific term and indigenous terminology within the community. Furthermore, the existence of these indigenous terminologies can be useful for future communication between local communities and conservation agencies.

The majority of respondents (87%) were unaware of existing conservation programmes within the iNanda mountain region. Furthermore, 16% of respondents stated that they were active members of the Indigenous Trees for Life Programme, one of the existing community-based

conservation programmes within iNanda. Unfortunately, community participation in conservation activities was noted to be low, despite considerably high levels of awareness. Further statistical testing revealed no significant relationship between awareness of conservation and participation in existing programmes ($p = 0.375$), suggesting that increased awareness of the programme amongst the community may not yield increased participation. These results align with the assertions made by Stern (2000), who states that awareness and knowledge may not necessarily manifest in action. More importantly, involvement in conservation activities might have been a consequence of respondents' limited awareness of current conservation programmes within the community.

Nonetheless, focused attempts to improve public awareness of existing conservation practices may enhance community involvement. The majority of respondents (92%) felt that the KZNSS grassland patch should be conserved. This is unsurprising, given that many of the respondents utilised the site for a variety of purposes. Furthermore, this finding indicates that respondents attached value to the grassland patch. Similarly, 97% of respondents indicated willingness to be part of future conservation programmes. These are critical findings that can be used to legitimise and expand on existing conservation practices, given that most respondents acknowledged the need for and a willingness to be part of local conservation practices.

Even though a significant percentage of respondents indicated willingness to be part of local conservation strategies, one should adopt caution in assuming that these individuals will in fact act on their intentions. According to Stern (2000), there is a significant difference between environmental intent and action; and while individuals may display environmental concern and pro-environmental intent, this does not always manifest in their actions. Responsible environmental behaviour is the cumulative effect of several factors, such as socio-economic comfort, values, beliefs, norms and personal security (Stern 2000). Perhaps respondents' perceptions of the values associated with the KZNSS grassland are a consequence of their needs and result from the extensive use of the ecosystem for their livelihood, and they hence expressed a willingness to be actively involved in conserving the grassland. Similarly, Berkes (2004) is of the opinion that poverty is a major barrier to sustained participation in conservation programmes. However, further research needs to be conducted to evaluate the extent to which poverty and livelihood security influence involvement in conservation and environmental protection. Undoubtedly, publicising benefits that are relevant to the local community and 'incentivising' participation in conservation initiatives may improve community-level participation.

Further research is recommended to investigate local community needs and challenges so that incentives are more applicable and therefore more attractive to community members. Thus, a key recommendation emanating from

TABLE 1: Respondents' perception of the term 'conservation' ($n = 100$).

Definition of conservation	%
Keeping/maintaining natural environments	26
Protecting all aspects of nature	45
Restoring damaged ecosystems	3
No response	6
Not aware of the term	20

the present study is the need to establish baseline information so that intended benefits become more relevant and context specific. Additionally, owing to the large socio-economic diversity characterising developing countries such as South Africa, conservation and environmental protection authorities should avoid generic programmes that assume homogeneity across communities. Incorporating local dynamics provides an opportunity in conservation planning and implementation and community involvement.

Conclusion

Contemporary conservation research argues for people-centred approaches that seek to provide multi-level benefits to local communities, especially within developing contexts. However, there is a dearth of information regarding local experiences and perceptions of CBC initiatives within these contexts. In this regard, the present study examined the potential constraints and opportunities for community-based conservation approaches for the KZNSS grassland patch by examining levels of awareness, perceptions and specific uses. Using the case study of iNanda, variables such as level of employment, awareness, utility of these ecological spaces, and willingness to participate emerge as key factors that need to be considered during the design of future conservation initiatives for the grassland.

The study shows that low levels of employment and increased dependency on environmental goods and services may be seen as opportunities for local-level involvement. Results suggest that the potential disruption to livelihoods owing to the deterioration of the grassland patch can be viewed as adequate motivation for community involvement in future conservation plans. However, it should be noted that disruption to these livelihoods as a result of restricted access to and use of the grassland may discourage involvement. The prospect of financial or physical benefits, as a consequence of participating in future CBC programmes, represents an opportunity for local government and conservation authorities. However, access to and the distribution of these benefits across community members needs to be equitable, representative and transparent to maintain partnerships. It is recommended that the local community is engaged and adequately represented when implementing future KZNSS grassland conservation programmes, especially during the design and implementation phases.

The limited levels of awareness of existing conservation programmes in iNanda could be a major challenge to future conservation efforts. Therefore it is recommended that future conservation plans be accompanied by awareness campaigns that disseminate information to the target community. Likewise, low levels of community participation in existing conservation initiatives could be attributed to community members failing to recognise the benefits of these conservation initiatives. Nonetheless, the present study shows that respondents displayed valuable knowledge in their perception of environmental change over the past 10 years. Developing partnerships with local communities

can enhance ecological monitoring opportunities and can achieve some of those elusive multi-level conservation goals, particularly in relation to local-level environmental monitoring. Mehta and Heinen (2001) state that a major critique of CBC programmes is that they fail to transcend environmental protection, and do not adequately address monitoring and evaluation needs.

The most noteworthy finding emanating from the present study is the overwhelming willingness by respondents to participate in local conservation practices. Perhaps in the case of iNanda, the lack of awareness of existing conservation programmes constrained public participation. Furthermore, some researchers, such as Mehta and Heinen (2001), are of the opinion that empowerment and education are the most important benefits derived from CBC programmes. However, in communities such as iNanda, employment opportunities and economic benefits would be more applicable, given the current socio-economic needs. It should be noted that the researchers were initially met with hostility when probing issues relating to conservation, which suggests some level of discontent amongst respondents; therefore, specific causes and reasons for these attitudes need to be further investigated as these may influence future participatory-based conservation initiatives within the community.

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Competing interests

The authors declare that they have no financial or personal relationships which may have inappropriately influenced them in writing this article.

Author's contribution

S.S.N. undertook literature review, data analysis and write-up. H.Z.B. undertook data collection and literature review. S.M. undertook literature review, data analysis and write-up.

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